SUSTAINABLE METROPOLITAN DEVELOPMENT
A LOOK AT PLANNING AND DEVELOPMENT IN ATLANTA, GEORGIA

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SUSTAINABLE METROPOLITAN DEVELOPMENT
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

SUMMARY

This study analyzes the relationship between comprehensive planning and actual development (as measured by changes in welfare) for 158 jurisdictions in metropolitan Atlanta. Relying on ecological economics for a method to measure welfare and planning literature for a method to evaluate the content of comprehensive plans, this dissertation uses a combination of quantitative and qualitative methods.

Development is measured for four dimensions of sustainable development (economic, social, environment, and resource) using a modified Genuine Progress Indicator, and the metropolitan Atlanta area is found to have had weakly sustainable development from 1980 to 2000. In all places, economic welfare increased and resource welfare decreased. Social and environmental development had mixed results with about half of jurisdictions showing increases in environmental welfare while less than a handful showed increases in social welfare.

Comprehensive plans were found to have a range of overall plan quality scores (the average of scores of policy statements in a plan) from 1.3 to 3.2 with a mean of 2.3 out of a maximum of 4. Of 2564 policy statements, 541 (or 21%) were high quality statements scoring 4/4 points while 708 (or 28%) received no quality points - they were weakly worded, vague, and not measurable. The average commitment to sustainable development (percent of policy statements in a plan that are related to a principle of sustainable development) is 39% with a minumum of 9% and a maximum of 80%. Plan policy statements coded for principles of sustainable development were found to have significantly higher quality scores while overall plan quality scores were not found to be correlated to the plan commmitment to sustainable development; this implies that plans are generally either rigid (having highs scores) or visionary (having high commitment to sustainable development) overall.

Plan quality was found to have a significant negative relationship with sustainable development, when dimensions are considered. This relationship was stronger for plans completed within the study time period (before 2000), suggesting that this relationship may be causal. The negative result is unexpected and leads to a rejection of the hypothesis that high quality planning would be

significantly and positively related to development.

On the other hand, plan commitment to sustainable development was found to be weakly positively related to sustainable development although the dimensions of this relationship changed over time. As such, the hypothesis that commitment to sustainable development would be significantly and positively related to development cannot be rejected.

These results hold even when looking at distinct growth patterns across the metropolitan region, suggesting that the relationships between plans and development may be applicable to other places.

CHAPTER I

INTRODUCTION

1.1 Need for sustainability

Global environmental and resource degradation accompanied by decline in social capital highlight the need for a change in trajectory for how our society develops. International efforts first focused on national level actions; realizing that real change for sustainable development would require local action, the focus has shifted. The idea is that the economy, environment, and equity must move together to support sustainable development. Communities across the country have been including sustainable development ideas in their long-range plans to address concerns for pollutants in our air and water, health of our ecosystems, loss of natural resources - particularly of fossil fuels. However, the relationship between good planning and sustainable development has not been measured empirically. In addition, Georgia has been largely ignored by planning researchers at a time when its plans are directing development to accommodate tremendous growth in population, especially in the metro Atlanta area. Ironically, Georgia provides an ideal planning research location due to the state tying money to planning and the small county size.

Metro Atlanta has been the example of the sprawling mega-city with an ever expanding appetite for natural resources that has been so critically sized up in research and popular press before. The metropolitan region IS growing fast; twelve counties in the area were among the 100 fastest growing counties in the United States from 2000 to 2008, and three of those were among the top 10 (U.S. Bureau of the Census, 2009b). In the past fifty years, the region has gone from one of several southern mid-sized cities to an almost default capital of the South - headquartering top companies and providing regional locations for federal offices.

1.2 How places might move towards sustainability

Along with individual consumption choices, the largest contributers to consumption and waste production are the built environment and the urban form - locations where people live, work, learn, shop and how they transit between these locations. Patterns of regional development that have been associated with unsustainability, such as “rigid separation of homes, shops, and workplaces” were put into place over decades and will last for at least several more decades (Ewing et al., 2003, p.1544). Local governments and citizens can work to reduce wastes created in the existing built environment while ensuring that new development is better. There have been no quick fixes for developing sustainable communities. What will move places towards sustainability is improving upon existing efforts to pull together economic, environment, and equity concerns. “Sustainability in the US...*will not* be the result of a paradigm shift, but an extension of existing practices that, when coupled with social equity and environmental concern *may* produce sustainable outcomes” (Krueger and Agyeman, 2005, p.414, emphasis in original).

While governments and citizens are working to improve their own conditions and quality of life within their boundaries, they cannot forget the larger setting. To address the possibility of a potential narrow focus on how to reach local sustainability, Satterwhite (1997) labeled five categories of environmental action necessary for sustainable cities; they are: 1)controlling infectious and parasitic diseases, 2)reducing chemical and physical hazards in the built environment, 3)high quality urban amenities such as parks, natural and cultural resources, 4)minimizing transfer of environmental costs outside of the place, and 5)progress towards sustainable consumption or resource balancing. While Satterwhite (1997) was interested in broader global concerns, these same ideas are generally taken for granted in the United States with only 4 and 5 still not systematically addressed. It is indeed these last two that most recent attention on sustainability, and the attention of this study, has fallen.

A completely obvious “Five milestones to sustainability” is offered by ICLEI-Local Governments for Sustainability USA to “provide a simple, standardized means of assessing sustainability challenges, establishing goals, developing and implementing a plan, and monitoring, measuring and reporting performance.”[1] Sadly, the milestones are: 1) conduct a sustainability assessment, 2) Set sustainability goals, 3) Develop a sustainability plan, 4) Implement the plan, and 5) Monitor and evaluate progress. These milestones are too vague to be helpful, and they are neither simple nor standardized.

[1]ICLEI was established as the International Council for Local Environmental Initiatives. The organization is now officially ICLEI-Local Governments for Sustainability.

What does seem to be clear is that local long-range planning must be incorporating the principles of sustainability if it is indeed a goal. In 2006, a survey of medium and large cities in the US found that sustainable development was not a framework for planning; rather, cities self-identified to have adopted ad-hoc, piecemeal sustainability initiatives (Saha and Paterson, 2008). This finding is similar to Berke and Conroy's detailed review of thirty comprehensive plans from municipalities around the country in 2000, where plans did not appear to take sustainability into account or only considered one or two principles of sustainable development.

1.3 Metropolitan Context

1.3.1 Increasing importance of metropolitan regions

Because of the acknowledged mass movement of people into large metropolitan areas and the need for coordination for both job availability and mobility, the metropolitan region is the right focal point for sustainable development (Rees and Wackernagel, 2008). The highly urbanized nature defining metropolitan areas precludes the expectation of self-reliance because cities and metropolitan regions simply cannot be sustained by their resources alone. So, these areas must be extra cautious about their imports of resources and exports of pollution and waste. Alberti (1996) refers to the land necessary to provide resources and sink wastes as "urban ecological space." Going further, cities are called upon to minimize their impact on natural resources, import only from those places which have a surplus of resources, and provide extra compensation for the resource depletion that they are causing on their suppliers (White and Whitney, 1992).

While reasonable disagreements abound about what defines good development patterns, there is greater consensus about what is not good - namely sprawling development of low intensity residential tracts requiring more and larger roads and elimination of mobility options (Ewing et al., 2003). Ziegler (2009) proclaims that sprawling development is necessitated by the legal environment of local development: a mix of zoning, taxation, and mandates. Along with individual consumption choices, the largest contributers to consumption and waste production are the built environment and the urban form - locations where people live, work, learn, shop and how they transit between these locations. Patterns of metropolitan development that have been associated with unsustainability, such as "rigid separation of homes, shops, and workplaces" were put into place over decades (and still are) and will last for at least several more decades (Ewing et al., 2003, p.1544). Mobility and job choices make impacts across a metropolitan area by framing the choices available to residents.

1.3.2 Role of local action in sustainability

There is disagreement in the literature about whether cities are more or less impactful on the environment than more rural areas. In one of the few studies to focus on metropolitan regions, like this one, Brown et al. (2009) find that the 100 largest metropolitan areas in the United States tend to be more carbon efficient than the nation as a whole. They conclude that this would be good news because of the expected future growth of metropolitan regions except that not all the metropolitan areas are better than average performers; the highest carbon emitting metropolitan regions are also the fastest growing. Tentatively, Brown et al. (2009) offer that having a good public transit system and more densely packed population correlate with lower metropolitan carbon footprints. Extending the footprints analysis to global metros, Sovacool and Brown (2010) find that there is a wide variation globally in carbon footprints per capita and the makeup of the footprint between transportation and household uses. Again, they find tentative correlation between compact and dense urban forms, low carbon energy sources, and (this time) lower incomes with smaller per capita carbon footprints (Sovacool and Brown, 2010).

So much of what we "know" about good urban and metropolitan form is based on such tentative notions and inference. For example, Ewing and Rong (2008) start with the premise that detached single family homes are more energy intense than other housing types and suburban areas are more likely to have detached single family homes, so suburban ares will be more consumptive in household energy use. With exactly the opposite conclusion, Pachauri and Jiang (2008) state that more urban areas will be more energy consumptive because of the positive relationship between affluence and consumption and the positive relationship between affluence and migration to urban areas in China. Andrews (2008) argues that low density suburban areas could be more efficient because they don't have to deal with the effect of urban heat islands, but on the other hand, things are more spread out - leading to more traffic and longer distribution lines (and associated losses) for energy. And, Butler et al. (2008) conducted a study of air pollution in 32 large cities and found that some have lower air pollution than the national average and others have more.

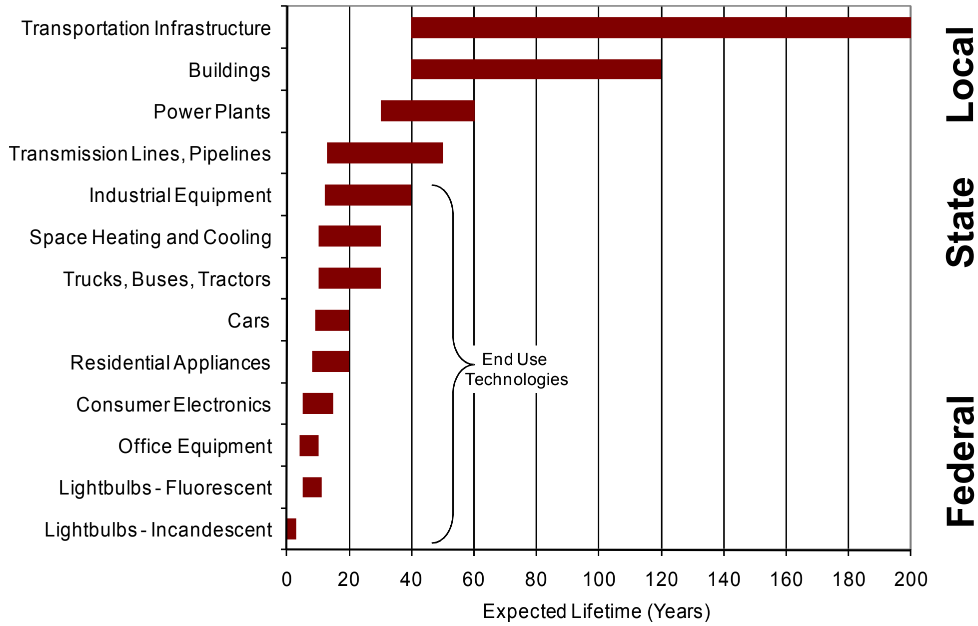

Figure 1: Energy Consuming Capital Stock and Level of Government Influence, adapted from (Brown et al., 2007, Fig 4.2, p.52)

Despite the confusion over whether a particular form or design of an urban space is more or less sustainable, local policy does effect future development. Several factors driving development (sustainable or otherwise) that can be affected by a local government are ultimately matters of urban structure: the design of the jurisdiction, the size and location of housing, the level and location of commercial and industrial enterprises, source of energy available, location of energy and water source, and the availability of alternative transportation. For some areas, such as energy, the local government's sphere of influence in is long-range, far longer than that of the realm of state and federal policies; with some exception, Figure 1 illustrates this relationship for energy consuming capital stock. One important exception is intercity transportation systems. While a local government can ensure that intracity alternative transportation options are available, they cannot change the fact that individual automobiles on freeways are the dominant mode of transportation. This factor is controlled by federal, state and regional forces (Marshall, 2000).

Despite the influence of local decisions on the long-term urban form, internal characteristics of residents (commercial, industrial, and residential inhabitants in the jurisdiction) are strong determiners of consumption. Local governments have little sway in consumptive choices beyond making choices available to residents, such as safe walking paths, alternative transport, and local jobs.

Metropolitan areas with high transit ridership were found to have smaller per capita carbon footprints, based on carbon emissions estimated from transportation and residential energy consumption (Brown et al., 2009). Anderson et al. (1996, p.14) stated, "making adjustments to urban form does not in itself constitute a direct energy conservation, but rather a facilitating strategy which makes a variety of conservation activities possible." Local governments can control building energy code enforcement to some extent, but even the most efficient home envelope does not prevent a high plug load.

While the majority of evidence links sustainable development with declining energy intensity, the belief that changing development and growth patterns can have a significant impact is not universally held. Some researchers have argued the contrary, that planning and urban form can simply not make much of a difference in energy consumption. Keyes (1977) estimated that realistic modification of growth in urban areas across the whole US could decrease total energy demand by less than one percent (0.35%) from 1972 to 1985. Others have argued that technological improvements are more effective than land-use planning (Small, 1980; Lave, 1978). Marshall (2000) takes the position that urban form cannot really be changed without a fundamental shift in the dominant transportation system, a factor almost entirely out of the hands of local government.

Besides urban form and transportation options, local governments plan to provide water, sewer, and solid waste services for their residents. The provision, pricing, and regulation of these services can drive different outcomes. In addition, local governments encourage economic development, bringing jobs to an area which could increase incomes, decrease underemployment, or decrease commuting times. Buildings and infrastructure last for a long time- decades or centuries. Because of their semi-permanence, buildings and infrastructure should not be developed in a haphazard manner. The "role of government in planning the shape and interaction of land-uses will inevitably be the crucial factor" (Jacobs, 1991, p.67). A more grim view is that because existing infrastructure, especially transportation infrastructure, was created to support decentralized development, attempts to avoid urban sprawl will be hindered (Wegener, 1986; Marshall, 2000). The opportunity to change urban structure through planning is with new development; this means that changing urban structure depends upon the rate of growth, as a non-growing area will not have the demand to build.

1.4 Measuring Sustainable Development

Indicators to measure sustainable development are necessary so that conscious actors (the people of a place) can change their patterns of behavior, improve urban quality in a direction that is more sustainable, and receive feedback (Alberti, 1996). People ultimately are the ones who must use the information gained from measures of sustainable development. It makes no sense to only measure environmental factors because they will not be owned by the citizenry; indicators must consider human needs and the built environment in order to be useful (Campbell and Heck, 1997). Because of the powerful nature of human economic and social concerns, it makes sense to focus on these measures of welfare. Robinson (2004) argues that moving forward with application of measurements of sustainable development and attempts to implement policy changes (actually taking actions of some sort) is the best way to make progress on both our collective conceptualization of sustainable development and the concrete ways of changing direction. Due to the complexity and implications of sustainable development, both scientists and policy makers have a responsibility to provide the basis for indicators. So far, there has been a problem of communication. Scientists tend to focus on what is measurable and might be representative without much regard for the implications of these choices while policy makers have focused on political and social implications, often desiring indicators to measure the immeasurable. The two groups need to clarify their roles and work together to implement successful indicators (Rametsteiner et al., 2011). A key area for joint work is in establishing biophysical limits against which some indicators can be assessed. Biophysical limits can be estimated scientifically, to a point, but ultimately they will be socially constructed and deal with difficult issues of equity and distribution (Jacobs, 1991; Hezri and Dovers, 2006). Hezri and Dovers (2006) claim that if policy makers, scientists, advocates, and journalists continue to use and discuss sustainable development indicators, eventually the public will change their expectations with regard to those things that are included in the measurements. Similarly, Innes and Booher (2000) claim that indicators are not effective unless they are taken for granted and ubiquitous.

An exhaustive review of sustainability indicators (more than 500 have been developed to date) is beyond the scope of this analysis; interested readers should see Bohringer and Jochem (2007), Moffatt et al. (2001), Innes and Booher (2000), and especially Singh et al. (2009). For the purposes of this research, development will be assessed from the viewpoint of ecological economics: sustainable development is represented by non-declining welfare so long as welfare includes economic, social, environment, and resource indicators.

1.5 Framework

In this dissertation research, the theoretical framework is based on the literatures from the planning and sustainable development communities. It relies on planning research for the idea that planning is an influential input to implementation and the idea that some information about plan quality can be obtained from the plan texts as artifacts. It relies on sustainable development research for the notion that development can be characterized by a change in welfare which can be measured with existing data. Both research traditions accept that there are other important influences in the process; these influences represent the context in which planning and development occur. A diagram of the theoretical connection between planning and development without the context is shown in Figure 8; it is shown here to set the stage for the background information that follows, but a full description of the theoretical framework can be found in Chapter 4. Due to the many intervening factors and time constraints of this research, caution is urged when considering the causal implications of this framework. With the current state of knowledge in these fields, the best that research can attempt to show at this time is relationships; future work is needed to extend these theories into a more causal form.

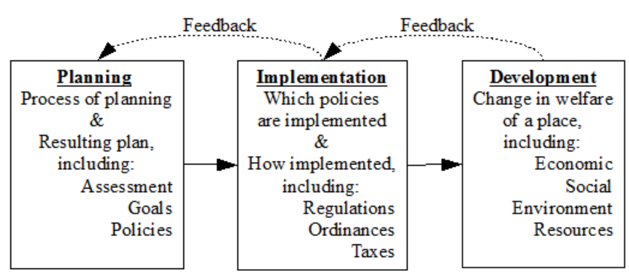

Figure 2: Theoretical flow from planning to development

1.6 What this research brings

How does comprehensive planning relate to actual development? This is an outcome evaluation, this sort of evaluation is rare in the literature. Both Talen (1996) and Berke and Godschalk (2009) argue that outcome evaluations are needed to compare theory to practice beyond plan development and complete the circle with feedback. Outside of academia, such evaluations are helpful to provide data, benchmarks, and feedback to local citizens and planners who are limited in resources. The results of this dissertation show that planning is related to development, but the relationship between plan quality and outcomes is not in the expected direction. Some explanations of why this might be the case, such as plans might be of very high quality with a reactive message when things are not going well for a place, are discussed in Chapter 6. While the plans under study are limited to those in the 28 county metro Atlanta, Georgia region, the results are expected to be somewhat generalizable. If better plans are related to better development in Atlanta, the same might be expected for other places like Atlanta. This is because of the exemplary nature of the case of Atlanta and previous applications of the methods used. Future research will be needed to gather more confidence regarding generalizability.

In the process of developing an outcome evaluation, this research also makes two methodological contributions to the literature which will be discussed again in Chapter 7. First, the method of measuring development is adjusted for applicability to the local government and metropolitan level. Second, the method of plan evaluation is modified to separate the concept of plan quality from commitment to a particular area of interest; a need for a consistent method of plan evaluation that could be used across interest areas has been identified by Norton (2005) and Berke and Godschalk (2009). Both of these efforts move the state of the method a little bit forward, with suggestions for future work included in the concluding chapter. This work provides additional information to be used in development of stronger theories related to planning and development.

1.7 Organization

This dissertation is organized as follows. Chapters 2 and 3 provide background information on the subjects under study - sustainable development and local planning. These two fields are pulled together in Chapter 4 to present an overall framework for the dissertation research. Chapter 5 provides a detailed methodology for the research. Both the results and discussion are presented in Chapter 6; conclusions follow in Chapter 7. Detailed data tables are included in the appendices.

CHAPTER II

MEASURING METROPOLITAN SUSTAINABLE DEVELOPMENT

2.1 Introduction

What does it matter how much money or value we produce today if we are killing future generations to do so? While this seems like an obtuse question for arguments sake, it is exactly the type of question that is leading a shift in global measurement of progress. It isn't entirely for argument's sake; natural resources are being depleted, anthropogenic contribution to global climate change is gaining support, and millions of people across the globe live in poverty. As we look into the future, we can imagine that future generations might not have the resources to live as we have been lucky enough to do, and they may also face a much harsher environment - certainly, just having more people with limited resources is a concern. There is hope that reducing consumption and wastes today can change the fortunes of our progeny. Such action, however, will require a more holistic measure of progress than has been used in the recent history. While the gross national product (GNP), a measure of economic output, is still measured and used in comparisons and analyses, a whole new method of accounting for sustainable development has been gaining ground.

The term 'sustainable development' is quite common in both popular press and academic discourse. However, its meaning is not particularly clear; Solow (2000, p. 132) claims that sustainability simply cannot be precisely defined, but "[i]t is not meaningless, it is just inevitably vague." And, Redclift (1999, p.66) notes that the term 'sustainable development' collected even more problematic "conceptual and political baggage" than sustainability before it.

Because of the potential for vagueness and politicization, it is imperative that researchers clearly define what they mean by sustainable development. In this chapter, sustainable development is defined and then further broken into dimensions and principles that allow for operationalizing of the term. Once defined, discussion turns to how to measure sustainable development; specific concerns for measuring sustainable development at the local level are addressed.

2.2 *What is sustainable development?*

2.2.1 Defined

Despite the potential for different interpretations, the definition for sustainable development used most frequently was put forth by the United Nations in the Bruntland report, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p.43). Sustainable development is then about equity of intergenerational distributions; however, it does not avoid the problems of intragenerational inequities (Redclift, 1999). None other than Rawls (1971) argues that there is a problem with inter-generational justice, as "[w]e can do something for posterity, but it can do nothing for us." Since we cannot know the circumstances of future generations, we are ill-equipped to determine what can be consumed and what can later be substituted; however, we can assume that future generations are like us but with (hopefully) technological improvements (Solow, 2000).

Approaches to sustainable development vary widely, but themes can be pulled from different schools of thought. Bartelmus (2008) refers to a continuum between neoclassical economics and deep ecology; Table 1 clarifies the positions as he describes them. This continuum roughly parallels the conceptualization of sustainability from weak to strong, where weak sustainability assumes substitutability between natural and produced capital and strong sustainability requires that separate accounts be maintained - limiting sustainable development to that which doesn't deplete natural capital faster than it can be replaced. Neoclassical economics doesn't have much to say directly about sustainable development, but the purpose of neoclassical economics is to describe the operation of markets; it is useful for those interested in sustainable development as it can present theoretical models of individual and collective choice - decisions that can move toward or away from sustainability. Environmental economics extends the economic ideal to natural capital; indeed, Wackernagel and Rees (1996) argue that environmental measures should take priority over economic ones because the economy is wholly dependent upon the resources provided by the natural world. It is with ecological economics and deep ecology where most of the work on measuring development for sustainability resides; ecological economists attempt to further extend economics to measure social factors while deep ecologists attempt to define the biophysical limits of the natural

Table 1: View of Sustainable Development (adapted from Bartelmus (2008, Table 2.1, p.24))

⇐Weak Sustainability Strong ⇒

	Neoclassical Economics	**Environmental Economics**	**Ecological Economics**	**Deep Ecology**
Basic Tenets	Consumer sovereignty	Limited Consumer sovereignty	Collective responsibility	Equality of species
Objectives	Utility and economic growth maximization	Utility and economic growth maximization (including social and environmental costs)	Reduced growth rates; Qualitative development	Negative growth of human activity
Justice	NA	intergenerational	intergenerational + intragenerational	intergenerational + intragenerational + interspecies
Sustainability Concepts	Maintenance of produced capital	Maintenance of natural and produced capital	Maintenance of natural, produced, and human capital	Restoration and maintenance of natural capital
Assessment	National accounts (GNP)	Environmental adjustment to accounts	Material flow; welfare; quality of life	Carrying capacity; resilience

world (Kissinger and Rees, 2010). Only ecological conceptualizations of sustainability truly separate natural and produced capital with the limiting factor being the ability of the natural capital to replace or repair itself. Note that even a terse review of the concept of sustainability brings us to the conclusion that growth is never sustainable. Growth cannot be sustained because eventually it must become less growth and then no growth for the system to be sustained. To clarify, imagine a sink; it can be filled at any rate until it is full. Once full, the sink cannot be filled at a rate that is greater than evaporation or any leaks in the drain because otherwise it will overflow. Now, replace growth of anything (population, resource consumption, pollution production) for the water in the sink and the earth for the sink. While neoclassical economists are concerned with the value of the drops, individually and collectively, environmental economists are concerned with the impact of those drops on the level of the sink. Ecologists attempt to describe the dimensions of the sink while ecological economists attempt to determine the flow rate and the current level in the sink. Because ecologists are still working to tell us how big the sink is - how much it can hold - ecological economists take an empty sink to be the goal.

2.2.2 Principles

Because the definition of sustainable development leads us nowhere with regard to being able to assess past development for sustainability or to push future development towards sustainability, principles have been put forth and agreed up for those things which sustainable development should embody. To get to principles, the philosophical discussion surrounds the question, "What do we want to sustain?"

The principles of sustainable development relied upon in this dissertation are those organized by Berke and Conroy (2000) who were also concerned with sustainable development in local comprehensive plans:

- Harmony with nature - places should accept their resources and choose to develop in a way that maintains the environmental services endowed to them.
- Livable built environment - when developing, places should ensure that the man-made environment is one that expands rather than contracts from opportunities and mobility for citizens.

- Place based economy - places should capitalize on local natural, built, human, and historic capital.
- Polluters pay - those who cause environmental destruction should be responsible for it.
- Responsible regionalism - places should accept that they are not in a vacuum and be amenable to regional needs.

2.2.3 Dimensions

The dimensions of sustainable development as it is now constructed are economics, society, and environment. Lehtonen (2004) argues that the three dimensions are not just neat equal circles that interact, but rather there is a hierarchy and social is the most important. Contrarily, the environment dimension can be seen as most important because it is relied upon for social and economic needs Wackernagel and Rees (1996). Economics is the default most important because economic measures are most pervasive; they are what we know. Because of a need to conceptually separate the capital of things that we have from the pollution that we generate, I think it makes most sense to use four dimensions: economics, society, environment (pollution), and resources (natural and man-made capital).

Figure 3 illustrates that welfare can be measured at two points, and an improvement between A and B implies sustainability so long as the metrics are consistent. Weak sustainability is assured if the combination of the four dimensions is used in both cases. Strong sustainability is assured if natural resources are not substituted for with man-made resources; to test for strong sustainability, the change in individual dimensions would have to be observed.

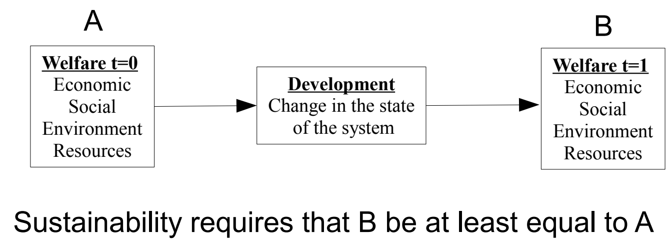

Figure 3: Conceptual Sketch of Sustainable Development

2.3 Measuring sustainable development at the metropolitan level

2.3.1 A good indicator

Metropolitan sustainable development requires that policies across the region are in concert with progress towards sustainability in social, environmental, resource, and economic dimensions. Any measure used for metropolitan sustainable development must: be plausible to construct at the local level, show differences between sub-metropolitan areas, aggregate to the metropolitan level, and be policy relevant by showing where action could make a difference. Four indicators that have been put forward to measure welfare and development beyond simple income or productivity are the following: Sustainable Measure of Economic Welfare (SMEW), Green GDP, Genuine Progress Indicator (GPI), and the Human Development Index (HDI). Table 2 shows that the GPI is the only one that meets the requirements for a good measure of metropolitan sustainable development

The GPI is not only the best measure for the purpose of measuring metropolitan sustainable development but also perhaps the most commonly applied single measure of sustainable development by ecological economists. This measure was originally introduced as the Index of Sustainable Economic Welfare (ISEW) but has been modified and called the GPI; it was originally proposed by Daly et al. (1994). In this dissertation, the GPI is used as a measure of welfare that covers all four

Table 2: Assessment of Welfare Measures

	GDP	Green	SMEW	HDI	GPI
Local level construct	•		•		•
Within metro differences	•	•	•	•	•
Aggregate to metro	•	•	•		•
Policy relevance				•	•

dimensions of sustainable development: economic, social, environment, and resources. Thus, the change in the GPI over time can be used to assess whether development over that time period was sustainable. In this section, the development, criticisms, previous applications, and modifications for use as a metropolitan measure are discussed. Within the discussion of the development of the GPI, other measures of sustainable development will be discussed as the GPI is a combination of other methods.

2.3.2 Development of the GPI

Three economic approaches together build the basis of the present ecological economics approach are discussed to explain the development of the current method. Economists define sustainability as non-declining welfare. The neoclassical economics approach is to define welfare purely by the national productivity. From this perspective, sustainable consumption is measured by the net national product per capita (NNP/capita); if this value could be sustained, welfare would be non-declining. In the 1970's two different schools of thought, welfare economics and environmental economics, attacked the neoclassical perspective as missing important measures of capital. Later, ecological economists attempted to pull ideas from welfare and environmental economists to include social and ecological considerations with economic measures. All of these efforts attempt to "green" or "blue" the more common measure of productivity or welfare.

2.3.2.1 Welfare economics and MEW

Welfare economists argue that the neoclassical definition of sustainability holds only in the case of constant population and labor productivity. In addition to the arguments for inclusion of a capital maintenance requirement, there are non-market values that might contribute to personal welfare that should be included in any measure.

The Measure of Economic Welfare (MEW) was put forth by Nordhaus and Tobin (1973) as a way to reconcile these differences; they hoped to show that national productivity was indeed a measure of welfare by comparing it to a modified version including some non-market values. The MEW starts with GNP, reduces it by the depreciation of capital to get to NNP, and then adds values for desirables and subtracts regrettables. Desirables are services from capital, and imputations for leisure and non-market labor. Regrettables are additional consumption, intermediate consumption, and imputations for urbanization. To determine the 'sustainable MEW', the capital to labor requirement, based on the cost of maintaining the same capital to labor ratio as the previous time period is subtracted. Ultimately, Nordhaus and Tobin (1973, p.521) conclude that "the progress indicated by conventional national accounts is not just a myth that evaporates when a welfare-oriented measure is substituted" because both the GNP and MEW show growth over time. While their MEW measure is nearly double the productivity measure in per capita dollars, the slope is smaller (see Figures 4 and 5). The four measures graphed are: GNP, NNP, MEW, and Sustainable MEW. The sustainable MEW measure appears to start off lower than the MEW, as expected, but sustainable MEW gets a boost from new net capital investment in 1947 and remains above MEW until 1965. This is an unexpected result not discussed by Nordhaus and Tobin (1973), but the likely cause is an increase in spending for federal capital improvement projects, such as the Interstate Highway System.

2.3.2.2 Environmental economics and Green GDP

While Nordhaus and Tobin (1973) do not measure environmental concerns in their MEW, they do give some consideration to the issue of natural resource depletion and pollution, noting that growth seems not to be the cause as those opposed to growth suggest; rather, misplaced incentives and a lack of equivalently priced substitutes are at issue. They conclude their consideration of environmental concerns with a call for greater research into global environmental issues, suggesting that economics alone has little to say for global ecological effects.

At the same time that welfare economists argued for inclusion of the capital maintenance requirement on the grounds of changing population needs, environmental concerns led to arguments for inclusion of natural capital. The "greening of the national accounts" movement garnered much attention and work, with little forward progress due to data difficulties and disagreements over when to use these alternative measures (Bartelmus, 2008). Natural capital depletion, the cost of damage to the environment, and the defensive costs of pollution abatement are the most commonly added values.

The System for integrated Environmental and Economic Accounting (SEEA) is potentially standardizing green national accounting. The SEEA has been modified from its original form due to arguments that valuation or imputation of values for non-market benefits and costs did not belong in

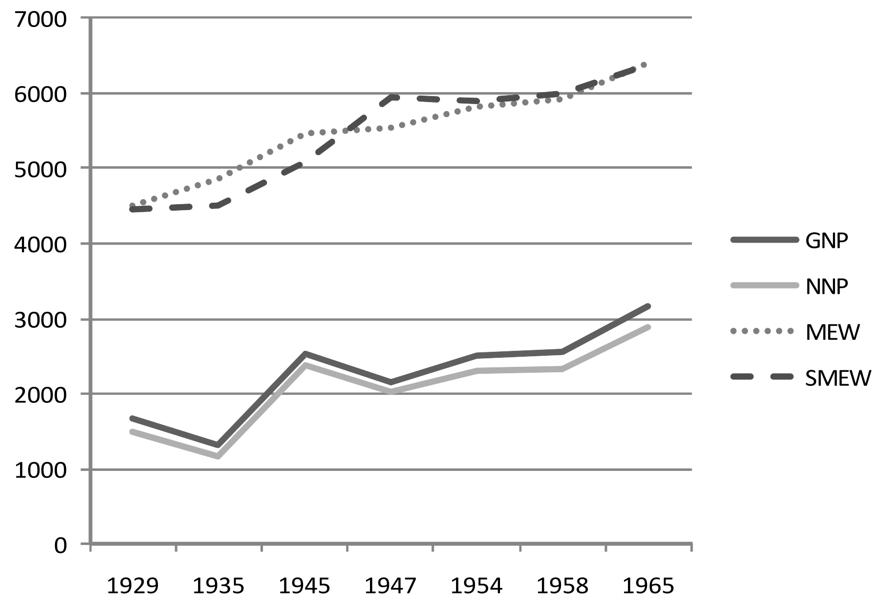

Figure 4: Per Capita Measures of Productivity and Welfare from Nordhaus and Tobin (1973, Table 1 & 2) (YR1958 USD)

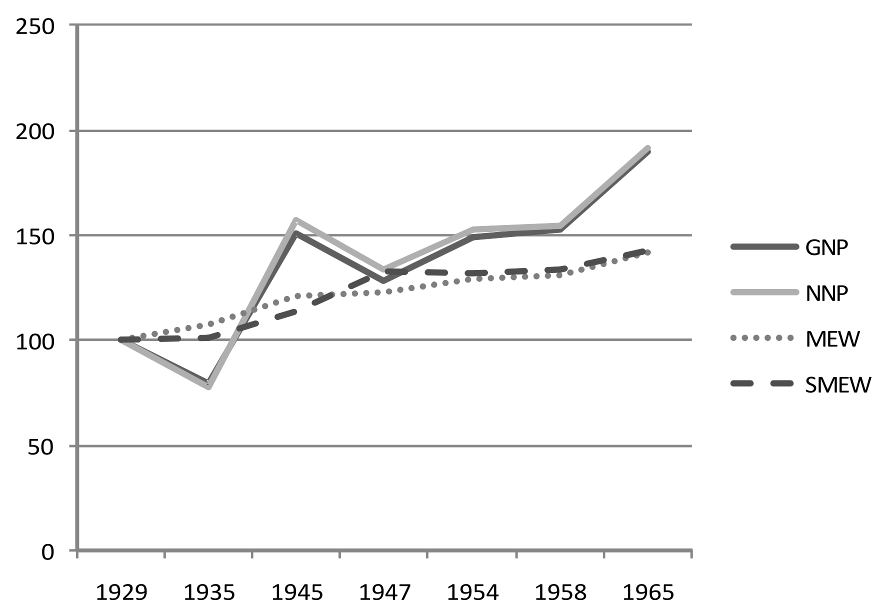

Figure 5: Indexed Per Capita Measures of Productivity and Welfare from Nordhaus and Tobin (1973, Table 1 & 2) (1929=100)

national accounts and should rather be measured in separate physical units (United Nations, 1993, 2004). However, this measure is far too detailed to be useful to local policy. The Sustainable National Income (SNI) takes a more humble approach; a point in time (in the past) is determined as a pristine goal period, and the income in any one period is adjusted by the costs estimated for the change from the pristine period (Hueting and Reijnders, 2004). Controversy arises in determining the period of pristine environmental condition and the subsequent costs.

2.3.2.3 Ecological Economics and the Genuine Progress Indicator

Ecological economists take issue with the neoclassical lumping of all types of capital together and ignorance of natural capital. In this view, the idea that natural capital, built capital, and labor are substitutes falls flat; indeed, these things are not logical substitutes at all. The absurdity of such substitutability is exemplified by considering the inputs to building a house: "we could build the same wooden house with, say, half the lumber and twice as many saws and carpenters" (Daly, 1990, p.36). Oddly, in development of a single index, Daly et al. (1994) indirectly support substitution between social, environmental, resource, and income measures.

The ISEW combined the ideas of the MEW with the Green GDP and contributed a few new terms. Interestingly, the theoretical underpinnings of the ISEW as a measure were not presented when the measure was first proposed, and never presented by the original authors. Lawn (2003) offers that the ISEW and follow-on GPI take as a starting point the Fisherian view rather than the Hicksian view of income; such a starting point assumes that welfare depends not on the rate of production and consumption of goods but the services enjoyed by their consumption. Further, the inclusion of a measure of income inequality takes into account the idea that an economy getting better on the backs of the poor would not be improving welfare. Despite the efforts by Lawn (2003) to provide a theoretical basis for this method, there are still gaps because ultimately the GPI is presenting a measure of welfare that relies on a multitude of theories from different fields. With more applications of the GPI, such as in this dissertation, understanding of the relationships between sub-measures grows, adding fodder to the discussion of a more unified theory of development. Such a theory may be the subject of future research.

The ISEW and the GPI have been applied to fifteen nations and eleven sub-national entities (states, provinces, etc), mostly in the developed world. In almost every application, the ISEW or GPI per capita has increased nearly in step with the GDP until the late 1970s or 1980s and then leveled off or decreased. There have been arguments for a threshold effect whereby welfare cannot continue to improve, based on this evidence. Others argue that the apparent threshold is an artifact of the method of increasing replacement costs and cumulative accounting of damages (Neumayer, 2000). However, it is also possible that a threshold is observed because the ISEW and GPI were designed to measure those things which have been recently observed or determined to cause detrimental effects. Had such indicators of welfare been developed a century ago, we might have observed a threshold as kerosene from whales was becoming more scarce, cities were facing increasing human waste and horse manure problems, and epidemics were crippling some societies. For now, it seems plausible that the threshold is an artifact of measurement, but the measurement itself still can provide useful information so long as we do not read too much into its variance from a single measure.

2.3.3 Criticism, Assumptions, and Uncertainty in the GPI

Despite its wide application, the GPI is certainly not a perfected measure. Brennan (2008) argues that the ISEW lacks complete theoretical connections to the capitalistic society on which it is based and a better system of measures would be based on political economy - where we "cannot separate the destruction of economic values and habits from the social lives of people in a measure of sustainable economic welfare" (p.17). This criticism is difficult to deal with if the desire for a monetary result comparable with GDP is desired as the result; however, it is in keeping with the original discussion of the economics of community argued for by Daly et al. (1994) in the original text that started the GPI snowball.

2.3.3.1 What about savings?

Starting with personal consumption makes sense as the GPI is put forward as a substitute of the GDP. However, what is personal consumption? Income less taxes is disposable income. Disposable income less personal outlays is personal savings. Personal outlays include: consumption, non-mortgage interest payments, and transfer payments (lending) (Bureau of Economic Analysis, 2010b). Consumption can increase, then, at the expense of personal savings and lending.

However, economic savings are part of the conceptual intergenerational equity desired by calls for sustainable development. Genuine savings (GS), another indicator measure of sustainability, relies on a non-declining savings rate (personal, corporate, and public) including resource depletion as an indicator of weak sustainability. The World Bank's GS is derived by adding domestic savings and public expenditure on education and then subtracting rents from the depletion of natural capital, depreciation of physical capital, and costs of carbon emissions; this savings figure is then divided by the GDP (Pillarisetti, 2005). A situation where income and consumption were rising and savings were falling can be imagined. In such a case, the GPI could show weakly sustainable development while GS researchers could arrive at exactly the opposite conclusion. Criticism has also been leveled at the GS measure as it, generally, finds resource-rich developing countries to be unsustainable and resource-poor countries to be sustainable. In addition, the GS has been argued to be of little policy value because removing the expenditures on education results in an insignificant deviation from the net savings already measured (Pillarisetti, 2005). Further development of a GS measure could emphasize relative natural capital stocks, include more natural capital resources (currently energy, mineral, and forest), and include additional pollution measures (besides carbon) (Dietz and Neumayer, 2004).

2.3.3.2 Indexing and comparability

In the GPI method, consumption is deflated by an income inequality index. The index is based on the lowest income inequality in the time period studied. In studies of the United States, the magical year has been 1969. Thus, the inequality adjusted income in 1969 would be equal to the unadjusted consumption starting value. For other years, consumption is deflated by a ratio of the income inequality in that year to the one in 1969. The idea is that increasing income inequality would deflate the starting point of the GPI because increasing income while increasing income inequality is not a desirable way to increase income. However, comparability loses; GPI measures with any other index than U.S. inequality in 1969 are not comparable to these. Whether or not the originators intended for it to be so, and it would seem that they did, the GPI will be compared across places because it can be. GPI will be compared as the GDP is compared, assuming that the ecological economists' arguments catch on. As such, the values must be comparable. Neumayer

(2000) shows that development of an index to any particular year also leads to the GPI as an index as well which cannot be logically compared to other measures of well-being, such as the GDP.

The solution, according to Neumayer (2000) is to use the Atkinson Index to create an income inequality deflater which is based on an explicit choice of aversion to inequality from 0 to infinity. While use of an explicitly defined aversion to inequality instead of a haphazard assignment of the lowest value does improve the robustness of the research approach to an index, I propose that deflating for income inequality should be done using an actual measure of inequality rather than an index. If there is perfect income equality, the starting point, or adjusted personal consumption, should be equal to the unadjusted consumption. Because perfect equality is not expected, all adjusted levels will be lower than the unadjusted levels. Such a method would work for many measures of income inequality, including the Gini index and mean to median ratios.

2.3.3.3 Starting point for human destruction

Different applications of the GPI take different years as the starting point for concern for accumulating environmental damage and determining which lands have been converted to development. According to the GPI, all land is either forest, wetlands, farmland, or not valuable. It is useful to understand this perspective, but difficult to implement it. If our time period is before human settlement in an area, all land that is settled is converted; if our time period begins after a settlement, the most desirable land already has been determined to be not valuable. This means that there are very steep implications for the GPI result. For example, in Europe, much development had occurred on the land by the 1600's when the lands in North America remained largely untouched. It is rather difficult to imagine records of what land was lost so far back in time.

And, even more important, is having some developed land less valuable than having a forest or wetlands? Whatever year is used as the starting point, either due to data availability or assumptions, should be explicitly noted and the implications of that decision must be addressed by the researcher. In this study, I use the earliest year that data were available for land-use at the county level in Georgia; this means that places developing during the study period will see greater costs than those settled earlier even if they have the same total percentage of developed land.

2.3.3.4 Accumulating costs

Perhaps the loudest criticism to address the GPI has been due to the method for determining the costs of long-term environmental damage and the cost of resource depletion. For the cost of long-term damage, the GPI accumulates costs over time (Neumayer, 1999, 2000). This is non-sensical because the costs used for long-term damage estimates are those describing the FUTURE COSTS of the damage do to consumption in that time. Because they are based on all future costs, the estimates of the cost of damage is already cumulative in the first place. As such, multiple counting occurs if all the future costs of consumption in time period 1 are included again in time period 2, 3, and so on. I do not accumulate costs in this study.

For the cost of resource depletion, the estimate is based on a replacement cost for resources consumed. GPI assumes that the replacement cost increases over time, with the cost based on ethanol (Talberth et al., 2007). However, the replacement costs are for more than just oil and technology deployment research shows that technologies usually decrease in costs over time. Other potential replacement options include advanced biofuels, solar power, and energy efficiency which may be decreasing in costs over time. I use the price of ethanol for consistency, but I leave the costs constant in time.

2.3.4 Modifying the GPI for Metropolitan Application

Nearly a dozen applications of the GPI have been to sub-national regions: Three each in the United States and the United Kingdom, two in Canada, and one each in China, Italy, and Australia. However, none of these studies attempted to compile a metropolitan GPI based on the sub-metropolitan governments. The most similar work has been that for portions of Ohio and Vermont where GPI calculations were made at the county and city level. In each case, only major cities were included.

Because of the limited information at the local level, some adaptations are necessary to create the best estimate of the GPI for local jurisdictions. Criticism has fallen on sub-national applications of the GPI for failing to acknowledge the implications of the modifications necessary (Clarke and Lawn, 2008). The major adaptations made for this study, and for local applications in general, are presented below. A fully detailed methodology for the present GPI calculation can be found in Section 5.2.

2.3.4.1 Personal consumption

The starting point of the GPI is personal consumption. However, personal consumption averages are only calculated at the national and metropolitan statistical area level, making state and local use of consumption percentages less than ideal. For example, metropolitan Atlanta's consumption portion of income decreased from 90.5% in 1980 to 65.7% in 2000, reflecting an increase in the average savings rate (or taxation). However, the national consumption portion of income increased slightly over the same time period from 76.3% to 79.8%. In addition, the definition of the metropolitan area changed during this time and eight counties are not in the metropolitan area in any of these three time periods. Therefore, the starting point for applying the GPI to a metropolitan area should be income rather than consumption. While using income increases the starting value, it avoids inserting error. In addition, the conflict between consumption and savings, discussed above, is avoided.

2.3.4.2 Net foreign lending

Subnational measures of economic performance do not detail foreign and domestic spending. As such, the net foreign lending is nonsensical. If there were adequate measures of foreign and domestic accounts, not only would net foreign lending be able to be included at the metropolitan level, but discussions on the intragenerational and international effects of local consumption could be started.

2.3.4.3 National averages and weightings

Several measures are based on national averages, limiting their variability at the local level. For example, the value of volunteer work is determined by the populations at different education levels in a place multiplied by the national average of volunteer percentages and hours volunteered for each education group. To the extent that any place differs from the national averages, precisely the point of measuring local performance, error is introduced.

Four measures have no variance at the sub-state level but are maintained for consistency. Both the long-term environmental damage and the depletion of natural resources terms are dependent upon energy consumption data. Such data are not available at geographies more refined than the state. Population weighting allows for a value to be attributed to each place, but differences in per capita consumption as well as energy sources are missed. Similarly, both ozone depletion and net capital investment are based solely on national estimates and population weighted to the local level.

If local governments choose to use the GPI for their own purposes, they are likely to be able to refine these columns to reduce the error.

2.4 Non-economic measures and the Human Development Index

Arguments against using economic theories to measure and model sustainability, for example by Daly et al. (1994), are based on the problems of abstraction that are introduced by the economic theories themselves but often not acknowledged. Rees (1999) highlights three abstractions that are very problematic:

1. Welfare is more than the production function. A single minded focus on increasing per capita income and thereby per capita consumption comes at the expense of providing for other non-consumptive human needs, such as community and safety.

2. People don't behave like the rational model. Individuals are not self-interested utility maximizers with insatiable consumptive demand. The rational model can hold so long as individual values for non-market items can be added, for instance: love, freedom, family, and spiritual enjoyment.

3. Land, whatever its use, has value beyond that with which it produces in commodities.

Because economic models are limited in explaining and advising welfare policy, approaches that focus on the social or biophysical factors have been developed. Ultimately, no matter how it is modeled, a sustainable level of consumption or rate of development must be bounded by biophysical limits; however, these limits will be socially constructed as we collectively decide what should be protected or maintained (Jacobs, 1991).

A single measure that could demonstrate actual quality of life in a place would be most desirable. However, quality of life indicators tend to focus on amenities that are not going to be affected by conscious acts of the population or the government of a place. In addition, the factors that could be affected by policy have unknown relationships; Agostini and Richardson (1997) cite the lack of relationships between such issues as violent crime and police expenditure and eduction achievement and teacher to student ratios in their critique of using quality of life measures. Quality of life indicators can offer insight into the reasons for choosing to live or work in a place, but they do not offer meaningful information about how to improve the place that you are in. Such information is clearly desirable when going through the trouble of evaluating progress in the first place; those conducting the investigation, or holding a stake in the future of a place, do not simply intend to pack up and move somewhere with more sunny days and a beach.

Because of potential limitations of the GPI, including previous criticism and the adaptations made here for its application to local jurisdictions, a second measure of welfare is constructed. This measure is the Human Development Index (HDI) (United Nations, 1990). HDI is one of many indicators of welfare that is not primarily an adjustment to productivity accounts, however, it is a well-known internationally developed measure for which data are readily available at the local level. The idea of the HDI is to look at three dimensions of human well-being to get an overall picture of welfare in a place: longevity, knowledge, and material living conditions. Longevity is measured by the life expectancy at birth; knowledge by the adult literacy; and material living conditions by the purchasing power of income. To create the index, each measure is assessed and then ranked against the rest of the world; the overall index is an average of the rankings of the three sub-measures. The United Nations reports these measures in the Human Development Report. Immediately, the idea that national averages do not represent the whole picture led to the development of specific population HDI measures within nations. Through such analysis, the plight of minorities and women can be examined.

Atlanta was included (and ranked 19 of 25) in an examination of the usefulness of the HDI at the city level in the United States (Agostini and Richardson, 1997). The authors modified the HDI to include measures that would show variation in the city HDI results; however, their method required reliance on metropolitan statistical area and higher geographical areas in some cases. Agostini and Richardson (1997) conclude that the HDI for cities can show relative rankings of cities on measures that are important to policy making; however, there were no clear patterns found in the results, and the data are heavily reliant on decennial census information - limiting their policy usefulness. It is also sobering to think about the time scales for improving the HDI; while income can increase in the near term, significant improvements in adult literacy and life expectancy are generational.

Biophysical measures, such as Environmental Space or Ecological Footprints Analysis (EFA), would be helpful for comparison because they give a direct measure of the impacts of consumption on resources. The logic of both Environmental Space and EFA is that there is only so much ecologically productive land on earth for all of the people (and other creatures). Therefore, each person's "fair share" of this land and its resources is based on the total amount of land and the global population. Since global population is ever increasing, the fair share is decreasing, suggesting that sustainability requires decreasing resource use over time (Wackernagel and Rees, 1996). Ultimately, the environmental space or ecological footprint is compared to the resources available. The footprint or environmental space needed per person is only a measure of consumption, having no meaning unless it is compared to biophysical limits through EFA or by identifying the 'sustainability gap;' defining the limits is contentious (Venetoulis and Talberth, 2008). Unfortunately, data are not available to make distinctions between the consumption habits at the local level. Any attempt to use the EFA would merely put rural areas ahead of more urban areas because of the larger usable land available to them; such a finding would be a perversion of the purpose of the EFA.

2.5 Summary

Sustainable development is development that results in non-declining welfare over time; therefore, it allows for intergenerational justice. Within this definition, four dimensions of sustainable development are defined: economic, social, environmental, and resources. Many indicators of welfare and sustainability have been proposed, but this research relies on the GPI, checked by the HDI. Proposed groupings of indicators for sustainability include: Maintenance of high and stable levels of economic growth and employment, social progress, effective management of the environment, and prudent use of natural resources (Moffatt et al., 2001).[1] I object to economic growth as an indicator of sustainability because high and stable economic growth is simply not sustainable; instead, the focus for economic levels should be on high, stable, and equitable levels of purchasing power. Growth is not sufficient to reduce poverty - especially if growth is unequal. Table 3 shows the five measures discussed in this chapter along with the dimensions of sustainability and specific indicators that are

[1]There have been several proposed groupings of indicators, mostly focused on the dimensions of economics, society, and environment; the ones presented in Moffatt et al. (2001) and repeated here are representative.

used in their construction. Wen et al. (2007) also divided up the GPI measures into dimensions of sustainability, but they only used economics, society, and environment.

The GDP, Green GDP, and the SMEW are limited in their policy applicability because they do not cover enough dimensions to be able to suggest where policy could change the direction. The GPI can direct policy attention to problem areas. The GPI can broadly direct towards economic, resources, environmental, or social dimensions while the HDI can identify inequalities in welfare across the region. Those areas showing good performance or improving performance on the GPI measures but not the HDI may be specifically targeted for improvement in community services for public health, crime, or education. Because of this, the GPI and the HDI will be used in this dissertation; their specific application is described in Chapter 5.

Table 3: Dimensions of Sustainability

	GDP	Green	SMEW	HDI	GPI
Economics	●	●	●	●	●
Income	○	○	○	○	○
Inequality				○	○
Consumption					○
Household			○		○
Volunteer					○
Underemployment					○
Borrowing and Lending					○
Social			●	●	●
Crime					○
Family breakdown					○
Loss of leisure			○		○
Car accidents					○
Commuting					○
Health				○	
Education				○	
Environment		●	●		●
Pollution abatement		○			○
Air pollution		○			○
Water pollution		○			○
Noise pollution		○	○		○
Long-term damage		○			○
Resources		●	●		●
Durable goods					○
Roads					○
Net capital investment			○		○
Farm land		○			○
Wetland		○			○
Forest land		○			○
Non-renewable resources		○			○
Ozone depletion		○			○

CHAPTER III

PLANNING FOR SUSTAINABLE DEVELOPMENT

3.1 Introduction

The premise of plan quality studies is that we can learn about how well communities address problems by evaluating plans. Published research on plan quality tends to assume that high quality plans lead to better outcomes. However, in an implementation study that did not evaluate plan quality, Waldner (2009) found that local jurisdictions don't necessarily follow through with their plans to restrict development in flood plains, airport hazard zones, and sensitive soils. Even the meaning of high quality is often issue specific - as in a high quality plan is one that includes goals and policies addressing a particular problem. For example, Berke and Conroy (2000) looked at the level of commitment to six sustainable development principles, and Brody et al. (2006) examined the inclusion of six specific sprawl reducing policies.

While the individual studies are applicable in their own area, they shed little light on plan quality in general. Norton (2005) offers the first overt effort to separate consideration of plan quality from an issue area; in that case, land use. Evaluations by Berke and Conroy (2000) and Conroy and Berke (2004) attempted to work around the issue of separating quality from commitment by only assessing commitment and limiting their study to plans already identified to be high quality from planning experts. However, these are the exception, and despite all the research on plan texts, we still know remarkably little about the relationship between plan quality and acknowledgment of or commitment to particular issues. While not directly called for by Berke and Godschalk (2009), their meta-analysis underscores the need to have consistent measures of quality. Similarly, in speaking of institutions, Crawford and Ostrom (1995) laid out a consistent way of describing and classifying statements or rules.

This chapter develops the reasoning for the method that will be used for evaluating plan quality and plan commitment to sustainable development in this research. First, plan quality evaluations in general are described. Then, those plan evaluations specifically targeting sustainable development issues are discussed. Finally, an overview of planning in the case area, metropolitan Atlanta, Georgia, is presented for context.

3.2 Plan Quality

There is a clear history of research in the planning community dedicated to measuring plan quality. This is done because theoretically, higher quality plans enable better action. Having a strong factual basis, measurable goals, and actionable policies indicate good plan quality (Burby et al., 1997). These three components are the legs of a planning stool, if you will, and they have been employed most frequently in plan quality evaluation studies.

Including facts, goals, and policies, there are ten characteristics of plan quality that have been considered in evaluation studies; seven of these refer to the plan itself (internal characteristics), and three refer to the situation of the plan in a larger context (external characteristics) (Berke and Godschalk, 2009). No study has included all ten.

3.2.1 Internal characteristics

Internal characteristics of plans refer to the contents of the plans - text, maps, drawings. Not surprisingly, the "good plan components": factual basis, goals, and policies, are the most studied internal characteristics. However, these three characteristics were found to have the lowest quality scores across the set of sixteen studies in Berke and Godschalk (2009). The low scores may be because evaluations of plan quality have been subject oriented, and researchers may define very narrow issues to investigate. Issues, internal consistency, implementation, and monitoring and evaluation characteristics were each examined by less than half of the studies of plan quality included in Berke and Godschalk (2009).

3.2.1.1 Organization and availability

A plan that is too complicated, confusing, or out of reach for the general public may not only alienate citizens during the participation and development phase, but may reduce awareness and ownership by the community after the plan is adopted. Berke and Godschalk (2009) place plan organization and presentation for ease of use and understanding for a wide variety of potential readers and users as external characteristics of plan quality; however, these are still referring to the actual plan contents and might also be conceptualized as internal to the plan.

3.2.1.2 Issues and vision

Having a future vision statement has been considered as a way to ensure that the community plan relates a vision of what the citizens want the community to become; it is assumed that this vision is commonly shared and not simply handed down by the government. When issues of concern are addressed as they relate to the future vision, the path necessary to reach that vision becomes more clear.

3.2.1.3 Factual basis

Facts are needed to help the community see where it has been and is now. Information addressing land-use, population, the economy, and other measurable artifacts are necessary for identifying problems and opportunities within the community. In Georgia, the factual basis is a required first step in the planning process - referred to as the Community Assessment (Official Code of GA. Sec. 36-71-11).

3.2.1.4 Goals

Having clearly defined, measurable goals can guide policy development and later implementation. Goals help remind implementers of policy what is intended when policy is not clear. Berke and French (1994) found that clearly defined goals from state mandates to local governments had a significant and positive effect on plan quality for natural hazards. There are six state planning goals in Georgia that must be included in comprehensive plans: Economic development, natural and cultural resource protection, adequate provision of community facilities and services, access to affordable housing, coordination of land-use and transportation planning, and intergovernmental coordination. Community goals are part of the Community Agenda in the Georgia planning process which cannot occur until the Community Assessment has been approved by the regional planning authority and the Department of Community Affairs. The agenda is designed to take the community (or county) from its assessment to its vision (Official Code of GA. Sec. 36-71-11).

3.2.1.5 *Policies*

Policy statements in comprehensive plans suggest that the plan composers and citizens actually were able to consider and discuss the best way for the community to meet its goals. In addition to this process benefit, actionable policy statements are like a roadmap for plan implementation. Policy statements describe the position of the planners and the community while providing direction to reach the planned vision for the future of the community. In Georgia, these policy statements are also part of the Community Agenda and are usually presented in plans as actions to take to reach goals and objectives. Because Georgia's planning laws read like a planning textbook, comprehensive plans in Georgia tend to include by rote those things that make up a good plan, but differences can be identified in the policies that each community chooses to pursue; for this reason, the present study focuses on the text of policy statements.

3.2.1.6 *Internal consistency*

Clear connections between goals and policies backed up with facts and drawn out in an implementation schedule provides full internal consistency. Assessing internal consistency can be difficult, especially if the implementation schedule does not cover the full period of the plan. For example, in Georgia, the implementation schedule is the short term work plan (STWP) which covers one to five years into the future, but the planning period is twenty years. This disconnect is logical and necessary because specific actions can not likely be projected far into the future, while planning must consider the long term.

3.2.1.7 *Monitoring and evaluation*

A good plan would include considering for how progress is monitored and plans are evaluated and changed over time to meet the changing needs of the community. Georgia plans must be updated every 10 years or if there is a compelling change in the community. In addition, STWP are supposed to be updated annually or every five years; if updated every five years, STWPs should include a list of accomplishments on the previous STWP. These efforts ensure some tracking of how the community is doing in reaching its goals and objectives and lend realism to the planning effort. In STWP updates, planners must provide reasons for tasks being abandoned or not finished.

3.2.2 External characteristics

There are a multitude of external characteristics that might affect plan quality. External characteristics of plans, in contrast to internal characteristics, refer to the context of the plans. How was the plan developed? Why? By whom? These external characteristics can be grouped into three areas: characteristics of the jurisdiction or community, population characteristics, and planning characteristics. Of these three, Berke and Godschalk (2009) only include the planning characteristics in their meta-analysis of plan quality studies; this is likely because studies of plan quality often use external characteristics as independent variables in their analyses of plan quality. In this study, external characteristics are included as the context affecting both plans and development and are discussed in Section 4.2.

External characteristics have been studied far less than internal characteristics (the plans themselves) in the plan quality evaluation literature. Of the sixteen studies included in the meta-analysis by Berke and Godschalk (2009), only eleven had considered any external characteristics. Coordination was included on some level by eight studies, compliance by seven, and organization and presentation by four (Berke and Godschalk, 2009, Tables 4, p.234).

3.3 Measuring commitment to sustainable development in plans

Jepson Jr (2001) identified four reasons that make incorporating sustainability into local planning as an obvious fit: 1) recognizing ecosystem needs and making changes are necessarily done at a local level, 2) there are mixed beliefs about urban form and environmental sustainability (urban advocates point to decreased per capita energy use and carbon emissions while others point to the needs of urban areas far outstripping the carrying capacity of the land around them) and changes to urban form start with planning, 3) sustainability requires long-range thinking about what a place will become, and 4) sustainability requires thinking across disciplines and departments.

One way to assess the commitment of a community to the principles of sustainable development is to examine the text of its plans, just as plan quality is assessed. Plans may show a desire to move towards sustainability, an understanding of what that movement means and will take, and how it can be done; or, they might show weakness in any of these areas. Plans might also show that a community is taking a myopic view of sustainable development - addressing only transportation, water, housing, open space, or some other issue and lacking a more holistic vision. Conroy and Berke (2004) found that state mandates for sustainability planning improved commitment to sustainability in plans; they suggest that the state mandate might "act as a scapegoat" for potentially unpopular ideas to advance sustainability principles. A relatively small number of plan evaluation studies have looked at sustainable development or related issues, such as smart growth, ecosystems, or climate change. The studies that have been completed offer a wealth of information. Table 4 summarizes these previous studies; note that CM means comparative and CS means cross-section. For comparison sake, this dissertation research is employing a cross-sectional design of comprehensive plans in Georgia.

Brody (2003c) and Brody (2003b) look at ecosystem in plans in coastal communities of Florida. Their evaluation method includes the traditional 0-2 quality scale (not mentioned, not detailed, and good) for ecosystem specific facts, goals, policies, coordination, and implementation which is converted into an index. They find that most plans are not high quality with respect to ecosystem management, having a mean score of 20.62 (standard deviation of 7.76) out of 50 possible indexed points (Brody, 2003b). Termorshuizen et al. (2007) also focus on ecosystems in plans by evaluating the level of commitment to ecological networks in Dutch local and regional plans. Their method included a set of 15 indicators or assessment questions for the 38 plans evaluated; while Termorshuizen et al. (2007) uses a different terminology, their work follows previous issue specific plan quality studies, focusing on targets (goals), qualitative and quantitative conditions (factual basis), and consideration for broader impacts (coordination). The results of their evaluation show that Dutch plans tend to acknowledge the importance of land use for maintaining habitat for certain species and for ecological systems in general, but most plans failed to include specific quantitative targets for natural resource goals and failed to quantify the potential impacts of land development (Termorshuizen et al., 2007).

Tang et al. (2010) measured the 'awareness', 'analysis capacity', and 'actions' for 40 local climate change plans.[1] A combination of the awareness, analysis capacity, and action of each plan was used to create an indicator of total climate change plan quality. This plan quality was then used

[1] Awareness, Analysis, and Actions are three critical components advised necessary to effective local climate change preparedness by (UKCIP 2003, California Climate Change Center 2006)

Table 4: Studies of Sustainability in Local Plans

Reference	**Subject**	**Design**	**Plans Studied**
Berke and Conroy (2000)	Sustainable Development	CM	30 plans from across the USA
Brody (2003c,b)	Ecosystems	CS	30 plans in Florida
Conroy and Berke (2004)	Sustainable Development	CM	115 plans from across the USA
Brody et al. (2006)	Smart Growth	CS	46 plans in Florida
Edwards and Haines (2007)	Smart Growth	CS	30 local plans in Wisconsin
Tang (2008)	Environment	CS	40 plans in California
Tang et al. (2010)	Climate Change	CS	40 climate change plans across USA
Termorshuizen et al. (2007)	Ecosystems	CS	38 plans in Holland

as the dependent variable in a regression analysis to determine what factors might influence climate change plan quality. Three groups of independent variables were identified: capacity of the local government, measured by political will, state mandates, and wealth; risk to the area from climate change, measured by distance to coast, population density, and hazard damages; and stress the area puts on environmental conditions, measured by estimated energy consumption, use of transit, vehicle emissions, and commuting times. Tang et al. (2010) found that plan quality we highly dependent on state mandates, as expected, but other variables did not present a consistent results. They theorize that local governments are limited in their capacity to plan for climate change, may have difficulty with long term planning when there are near term needs, and may need time to revise and reconsider climate change plans.

Berke and Conroy (2000) developed a sustainable development evaluation coding method which first determined if plans were guided by sustainable development principles and then classified the area, method, and degree of sustainable development commitment in each policy proposal of comprehensive plans. The sustainability areas that Berke and Conroy (2000) use are referred to as "principles of sustainable development" which fall into two goal areas of sustainable development: long-term ability of the area to sustain healthy systems - 1) harmony with nature, 2) livable built environments, 3) place based economies, and 4) equity; and a link to global concerns - 5) polluters pay principle, and 6) responsible regionalism. The method classification referred to the "how" the form of the policy proposed in the plan - was it a tax measure, a code, etc; there were a total of 27 development management techniques presented. These 27 techniques are grouped into six general types.

- Land Use Regulation: Density, permitted use, special study zone, sensitive area overlay, subdivision, and site review
- Property Acquisition: Transfer of development rights, Acquisition of land, Acquisition of development rights, Land bank, Acquisition of development units
- Capital Facilities: Phased growth, Concurrency, Location of capital facilities, Urban service boundary, Annexation
- Financial Incentives: Impact fees, reduced taxation, bonus zoning, exaction, land trust fees

- Building Codes and Standards: Local environmental impact statement, Standards for new buildings, Standards for retrofitting existing buildings

- Public Education and Awareness: Builder workshop, Public education program (job training), Information mailing

The degree of commitment was binary and coded ‘suggestions’ if the language was of the nature of “encourage, consider, intend, or should” and coded ‘requirements’ if the language was of the nature of “shall, will, require, or must” (Berke and Conroy, 2000, p.25). They employed a comparative research methodology with a group of plans that showed an overall commitment to sustainable development and a larger group that did not, and they found that overall commitment to sustainable development principles did not have a significant positive effect on commitment to sustainable development in the plans (Berke and Conroy, 2000; Conroy and Berke, 2004).

This binary coding is common in plan quality evaluation study. Specific types of policies or areas are identified, and the strength of language related to those types or areas of policy are measured to get at plan quality. In an institutional context, this is related to the “deontic” (forbidden, obliged, and permitted) of the ADICO method of classifying institutional statements (Crawford and Ostrom, 1995). However, there are other potentially useful ways to classify these statements; Crawford and Ostrom (1995) suggest that the other ways are by: attributes - who is affected, aim - to what the deontic part of the statement refers, conditions - when is the deontic applicable to the affected, and “or else” - what will happen if the deontic is not followed. In this dissertation, the deontic is included in the idea of strong statements, and the others are somewhat covered by whether or not a statement is specific and measurable.

3.4 Planning in Georgia

Georgia’s planning laws are arranged to encourage thoughtful growth-oriented planning at the local level that allows for cooperation at a regional level. Intergovernmental cooperation for planning and development was specifically authorized in 1990 (O.C.G.A. Sec. 36-71-11). There are six state planning goals: Economic development, natural and cultural resource protection, adequate provision of community facilities and services, access to affordable housing, coordination of land-use and transportation planning, and intergovernmental coordination. Local comprehensive plans must be in keeping with these goals and must be developed according to the process for planning laid out by the state.

3.4.1 Georgia planning history

Under then Secretary of Commerce Herbert Hoover, a prototype of model legislation to enable city planning was circulated in 1928, called "Standard City Planning Enabling Act". While Georgia was certainly not a first adopter of this idea, its current framework is bottoms up - the local governments have been enabled to plan and then those plans are to be used as the basis for regional and state planning. The Georgia Planning Act of 1989 enables municipalities and counties to develop comprehensive plans and land-use regulations. Regional planning has been envisioned by lawmakers in Georgia for half of a century; in 1957, the Georgia Planning and Zoning Enabling Act authorized local governments and businesses to develop Area Planning and Development Commissions (APDC). By 1969, there were eighteen APDCs across the state.

Regional Development Centers, mostly using existing APDC boundaries, were created by the 1989 Georgia Planning Act to "develop, promote and assist in establishing coordinated and comprehensive planning in the state, to assist local governments to participate in an orderly process for coordinated and comprehensive planning, to assist local governments to prepare and implement comprehensive plans which will develop and promote the essential public interests of the state and its citizens, and to prepare and implement comprehensive regional plans which will develop and promote the essential public interests of the state and its citizens" (O.C.G.A. Sec. 50-8-30). In 2008, these sixteen "regional development centers" were rebranded as twelve "regional commissions" and given a more distinct planning authority via HB 1216.[2]

The Georgia Development Impact Fee Act became law in 1990, setting up a framework in which local governments could require "new growth and development pay a proportionate share of the cost of new public facilities needed to serve new growth and development" (O.C.G.A. Sec. 36-71-1). The law requires that local governments have adopted a comprehensive plan that includes approved capital improvement elements before they can charge development impact fees (O.C.G.A.

[2]Two sets of RDCs were combined to make a total of twelve regional commissions. Macintosh Trail RDC and Chattahoochee-Flint RDC combined to make the Three Rivers Regional Commission; Coosa Valley RDC and North Georgia RDC combined to make the Northwest Georgia Regional Commission.

Sec. 36-71-3). Local governments must establish a Development Impact Fee Advisory Committee that includes representation by those most likely to be affected within the development and building industries; however, no action must be taken by this Committee before the government can adopt development impact fee ordinance (O.C.G.A. Sec. 36-71-5). Perceived inequities with development impact fees are to be reported by this Committee during annual government audits if the local government has more than 140,000 parcels of land (O.C.G.A. Sec. 36-71-8). Two public hearings, at least two weeks apart, must be held before the ordinance is adopted (O.C.G.A. Sec. 36-71-6). Because of the a priori investment required by local governments in the way of analysis, expectation of litigation, and competition with other localities for sighting of desirable new development, there have been few adoptions of Development Impact Fees.

3.4.2 Georgia planning requirements

The Georgia Department of Community Affairs sets minimum planning requirements. The minimum required planning efforts apply to counties and municipalities alike, but they are based on county populations and growth rates as of the most recent decennial census, as shown in Table 5. A minimal planning level is also set to avoid burden for very small municipalities. Almost all of the study area falls under the Advanced planning level.

In all but the smallest communities, which fall under the minimum requirements by the Department of Community Affairs, the process of comprehensive planning is the same. Completing the planning requirements ensures that counties and municipalities will be certified as "Qualified local governments" and eligible to receive certain state assistance.

Ultimately, the Community Agenda is what is adopted and then required to be implemented by the county or municipality. Implementation is done through the Short Term Work Program (SWTP) which is "for the purpose of scheduling specific actions that the local government intends to take to address the needs and goals identified in the [comprehensive] plan" (DCA, 2001). While the STWP can be updated annually or every five years, it is required to be updated annually for communities charging Development Impact Fees, and no Report of Accomplishments is required when the STWP is updated annually. The "Steinberg Act" (O.C.G.A. ğ 36-67-1 et seq.) sets additional requirements for planners in more populated areas with regard to changing zoning. While the act only applies

Table 5: Minimum Planning Levels Required (DCA, 2005)

Population	Planning Level	Requirements
-less than 300 -less than 500 with growth rate less than 2.5% for last decade	Minimal	Community Vision AND Short Term Work Program
-less than 15,000 -15,000 to 19,999 with an average annual growth rate of less than 2.50% for the previous decade	Basic	Community Assessment AND Community Participation Program AND Community Agenda
-15,000 to 19,999 with an average annual growth rate of 2.50% or higher for the previous decade -20,000 to 24,999 with ANY average annual growth rate for the previous decade -25,000 to 49,999 with an average annual growth rate of less than 1.50% for the previous decade	Intermediate	Community Assessment with additional data and maps AND Community Participation Program AND Community Agenda
-25,000 to 49,999 with an average annual growth rate of 1.50% or higher for the previous decade -50,000 or above	Advanced	Community Assessment with additional data and maps including a detailed evaluation of the local transportation system AND Community Participation Program AND Community Agenda

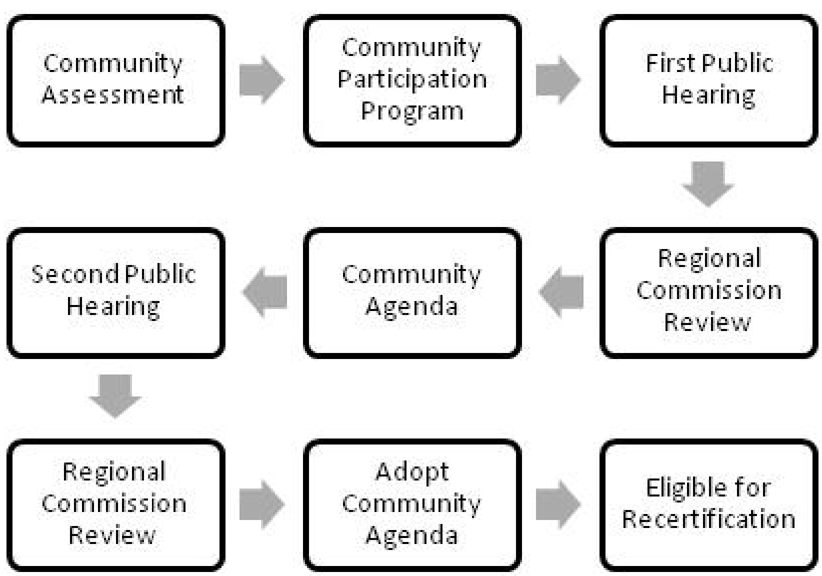

Figure 6: Comprehensive Planning Process in Georgia

to counties with a population of 500,000 [625,000] or more and municipalities in them with populations of 100,000 or more, the intent is to prevent reckless rezoning in urban environments. The population restriction severely limits the applicability of this law as, according to the 2000 decennial census, only Fulton, Dekalb, Cobb, and Gwinnett counties exceed the 500,000 threshold. Within these counties, only Atlanta has a population greater than 100,000. Thus, the statute only applies to four counties and one municipality; the 2010 decennial census may change this application.

3.4.3 Planning in Metro Atlanta

Planning in metropolitan Atlanta is complicated by the overlap of multiple cross-jurisdictional planning bodies. Those responsible for the comprehensive plans, for which I am concerned with in this study, are fairly straightforward. However, there are separate planning bodies tasked for water and transportation planning, obfuscating planning responsibilities and authorities. Here, comprehensive planning authorities are described for the study period and their current structure while other planning bodies are briefly mentioned in their current form as an overview.

- Comprehensive Planning

  During the study period, regional planning authority was held by Regional Development Centers. Seven Regional Development Centers are involved in planning for metropolitan Atlanta. Figure 7 shows the layout of the Regional Development Centers across the state, with counties labeled. All of the studied jurisdictions (130 cities and 28 counties) are organized as shown in Tables 6 and 7.

- Transportation Planning

  Every three years, the U.S. Department of Transportation reviews the Atlanta Regional Transportation planning process. There is both a Regional Transportation Plan and a Transportation Improvement Program. However, the Atlanta Metropolitan Planning Organization (MPO) includes only a portion of the metropolitan statistical area, and it is larger than the Atlanta Regional Commission,

- Water Planning Water planning in Georgia was mostly limited to local watersheds until 2008,

Figure 7: Regional Development Centers

Table 6: Places by Regional Development Center, except Atlanta Regional Commission

Georgia Mountains	
Dawson County	Dawsonville
Forsyth County	Cumming
Northeast Georgia	
Barrow County	Winder
	Bethlehem
	Carl
	Statham
	Auburn
Jasper County	Shady Dale
	Monticello
Newton County	Covington
	Porterdale
	Mansfield
	Oxford
	Newborn
Walton County	Social Circle
	Walnut Grove
	Good Hope
	Loganville
	Monroe
McIntosh Trail	
Butts County	Jackson
	Jenkinsburg
	Flovilla
Lamar County	Barnesville
	Milner
	Aldora
Pike County	Williamson
	Molena
	Concord
	Zebulon
	Meansville
Spalding County	Griffin
	Orchard Hill
	Sunny Side
North Georgia	
Pickens County	Jasper
	Talking Rock
	Nelson

Chattahoochee Flint	
Carroll County	Bowdon
	Villa Rica
	Temple
	Whitesburg
	Mount Zion
	Carrollton
	Roopville
Coweta County	Sharpsburg
	Turin
	Grantville
	Senoia
	Newnan
	Moreland
	Haralson
Heard County	Franklin
	Centralhatchee
	Ephesus
Meriwether County	Gay
	Luthersville
	Manchester
	Lone Oak
	Woodbury
	Greenville
	Warm Springs
Coosa Valley	
Bartow County	Kingston
	White
	Cartersville
	Emerson
	Euharlee
Haralson County	Bremen
	Waco
	Buchanan
	Tallapoosa
Paulding County	Dallas
	Hiram
	Braswell

Table 7: Places in the Atlanta Regional Commission

Cherokee County	Canton	Fulton County	Union City
	Waleska		Roswell
	Ball Ground		Mountain Park
	Woodstock		Sandy Springs
	Holly Springs		Fairburn
Clayton County	Morrow		Hapeville
	Forest Park		East Point
	Jonesboro		College Park
	Lake City		Alpharetta
	Riverdale		Palmetto
	Lovejoy		Atlanta
Cobb County	Marietta	Gwinnett County	Buford
	Smyrna		Berkeley Lake
	Powder Springs		Sugar Hill
	Kennesaw		Lawrenceville
	Austell		Grayson
	Acworth		Snellville
DeKalb County	Decatur		Duluth
	Clarkston		Suwanee
	Doraville		Norcross
	Pine Lake		Lilburn
	Avondale Estates		Dacula
	Lithonia	Henry County	Hampton
	Chamblee		Stockbridge
	Stone Mountain		McDonough
Fayette County	Peachtree City		Locust Grove
	Tyrone	Rockdale County	Conyers
	Woolsey	Douglas County	Douglasville
	Brooks		
	Fayetteville		

when the state legislature crafted a law enabling the Environmental Protection Division to assess supply and quality of water and use regional water planning councils to develop plans for water management. While the urban core of the metropolitan region already had a planning council, the twenty-eight counties are part of seven different water planning regions. As of 2009, regional planning commissions are required to work with water planning districts; this effectively gives greater responsibility to the planning commissions. Here is an example from 12-5-579(b) of Official Code of Georgia:

> Any commission. . .falling within the geographic boundaries of the [Metropolitan North Georgia Water Planning District] shall cooperate with the district and shall assist it in its efforts.

3.5 Summary

Plan evaluation research has previously focused on issue dependent measures of plan quality, but quality can be evaluated separately from issues. Sustainable development in planning has been called for by Jepson Jr (2001) and others and methods to measure commitment to sustainable development have been developed and tested by Berke and Conroy (2000); Conroy and Berke (2004). Planning the metropolitan Atlanta area represents a useful case because Georgia effectively mandates compliant local planning and includes principles of sustainable development in its planning goals.

CHAPTER IV

CONNECTING PLANNING TO MEASUREMENT OF SUSTAINABLE DEVELOPMENT

4.1 Planning to Development

4.1.1 Theoretically

A diagram of the theoretical framework is shown in Figure 8; this figure was also shown in the introduction. While the move from planning to welfare is presented linearly for conceptual simplicity, feedback loops illustrate the circular nature of the relationship. We might also imagine several parallel linear processes of planning and welfare.

Planning, implementation, and development occur in the context of the characteristics of the jurisdiction, people, and planning. The contextual characteristics are not merely in the background, as a setting for the action of planning, implementation, and development, but they influence, and are influenced by, the process. For example, population and growth will influence the focus of plans and their eventual implementation while the welfare of a place and its development both depend on and influence its population. Similarly, the political ideology of a jurisdiction may influence plans as well as their method of implementation while the welfare of a the jurisdiction and its development may influence the political ideology of its residents. Some contextual characteristics have less influence than others: planning experience is expected to directly influence planning, but would only go on to influence implementation and development through plans. Development and planning have been described in Chapters 2 and 3, and the context is described in Section 4.2.

What actually gets implemented is an entirely different discussion and beyond the scope of this analysis. Implementation comes after the passage of policy and is about 'making it happen'. Church and Nakamura (1993) describe implementation as including not only 'making it happen' but also defining what, exactly, 'it' is. Policies in plans can be implemented through vehicles like regulation, acquisition, expenditure, or taxation; both the vehicle of implementation and the parameters, such as how strict limits are or how high taxes are, can determine the effectiveness of the policy once adopted. Regarding implementation of local plans in particular, Filion (1996) finds that bold policies for sustainable development are impeded by two issues: 1) public aversion to change and 2) increased access to the political process makes many voices heard but impedes development of a cohesive plan of action. These findings from a case study of metropolitan Toronto show the importance of contextual variables in implementation, "there is every reason to believe that implementation difficulties may be even worse in metropolitan regions that are more politically fragmented than those of Toronto and that have suffered severe inner-city deterioration" (Filion, 1996, p.1655). Similarly, Alexander (1998) found that the difference between success and failure on implementation of coordinated airport planning was more likely due to cultural and social factors than the planning or institutional design. Despite these and other attempts to explore outcomes of planning, plan quality is still expected to contribute to better implementation (Talen, 1996; Steelman and Hess, 2009). Indeed, Brody and Highfield (2005) found that plan policies that were specific were more likely to be implemented.

Because implementation is likely to be similar to, but not a replica of, what is planned, it is not completely ideal to ignore the implementation part of the process. Unfortunately, measuring what is implemented in comparison to what is planned is impractical at best unless the study is contemporary. Documentation cannot describe what has actually occurred, and memories of what was meant by the plan compared to what was implemented are likely not to be reliable. The best that can be done is a policy by policy conformance evaluation - which only is plausible if the policy statement was both specific and measurable (Alexander and Faludi, 1989). And, even then, what conclusions could be drawn about the less specific and less measurable policies - were they not implemented? Because of these difficulties, this research will be linking the plans with development, leaving implementation as a black box and a rival hypothesis. Future research could follow implementation as it occurs, marking deviations from planning and exploring the reasoning for doing so with the appropriate actors.

This theoretical framework depends on four major suppositions.

1. Sustainable development can be represented by non-declining welfare, as measured by the GPI/capita over time. This further requires that the GPI/capita is a suitable measure of welfare and that its range within a confidence interval is not so large as to negate trends.

2. Welfare (GPI) at time $t + 1$ depends on welfare (GPI) at time t and development from time t to $t + 1$. Recall Figure 3.

3. Development between time t and $t + 1$ depends on local implementation of policies as well as other factors.

4. Local implementation is driven by planning. Better planning leads to better implementation.

This dissertation research study has three hypotheses falling from these suppositions.

H1 High quality planning will be positively and significantly related to sustainable development.

H2 Commitment to sustainable development in plans will be positively and significantly related to sustainable development.

H3 High quality planning will be correlated with a commitment to sustainable development in plans.

4.1.2 Operationalized

Making the connection between planning and any measure of development requires that planning has some influence on the areas measured. Figure 9 shows connections between dimensions of sustainable development and issue areas in comprehensive plans. See Table 3 and Section **??** for more detail on the measures of welfare used in each dimension of sustainable development.

The **social** dimension is measured using both the GPI for crime, family breakdown, leisure, and mobility. Social dimensions of development are best represented in comprehensive planning through policies for housing, cultural and historic resources, and community facilities and services. Housing policies ensure equity, affordability, and safety of housing provided in the jurisdiction. Cultural and historic resources policies ensure the maintenance of connections to the history, customs, and art of the population of the jurisdiction over time; such resources are primarily used for social cohesion, education, and leisure. Community facilities and services include crime prevention as well as health and education services.

The **economic** dimension is measured using the GPI for market and non-market labor and unemployment. The issue area in comprehensive plans most related to this dimension is economic development. Economic development policies are designed to maintain existing commercial and

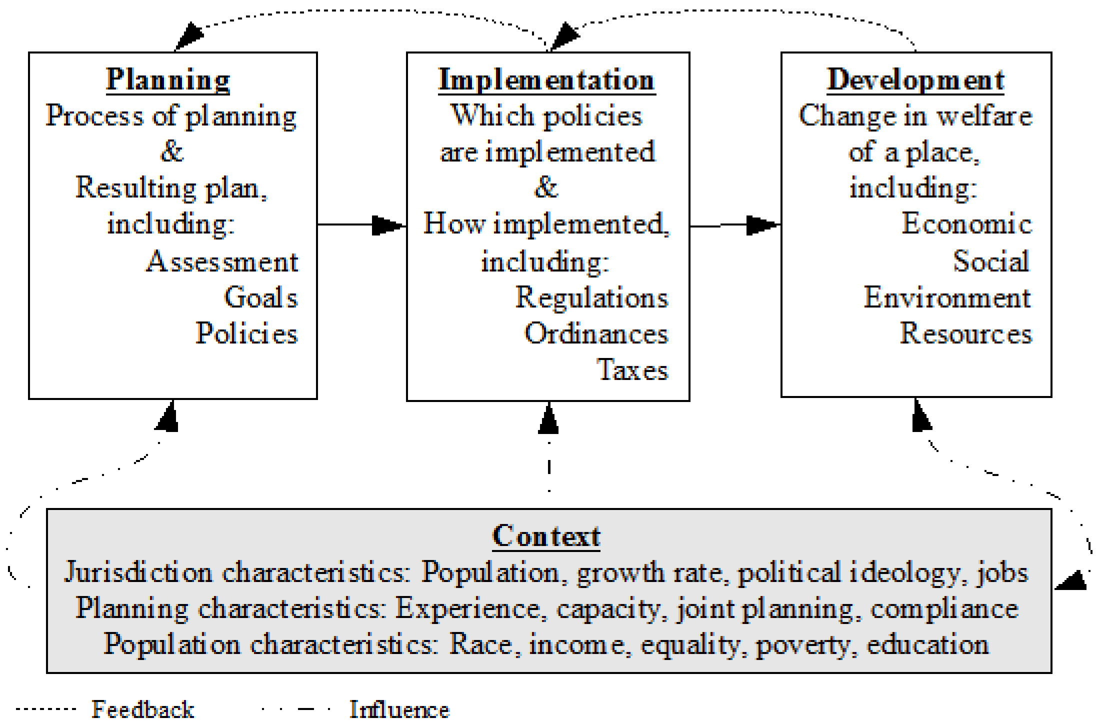

Figure 8: Theoretical Framework

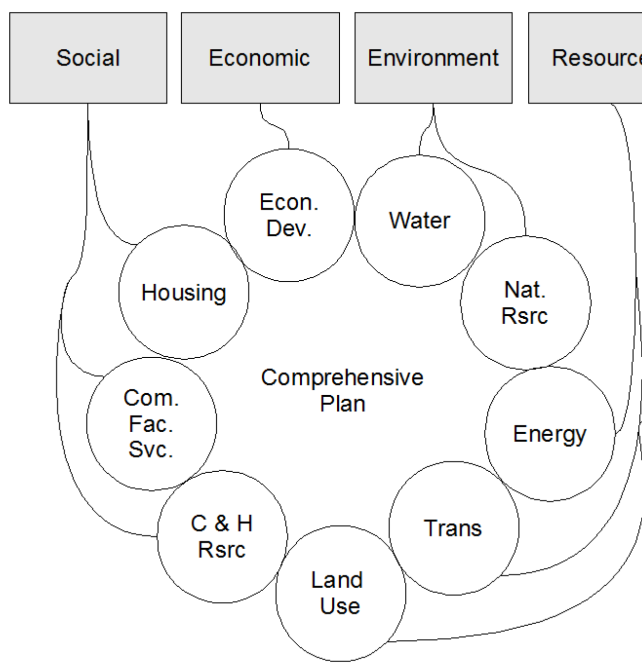

Figure 9: Plan Issue Areas related to Dimensions of Sustainable Development

industrial activities while bringing in new commercial and industrial activities in keeping with the future vision of the jurisdiction.

The **environment** dimension of sustainable development deals with maintaining the health of the natural environment and is measured in the GPI through pollution variables (air, water, noise), the defensive cost of pollution abatement, and long-term damage from burning fossil energy resources and use of nuclear power - fuel from which must be safeguarded for many generations with unknown consequences. In comprehensive plans, water and natural resource policies are most related to the environment dimension. Energy policies could deal with provision of local electricity or natural gas as well as energy efficient building requirements. Water policies deal with the protection, maintenance, and expansion of water and wastewater services. Natural resources policies identify and preserve natural lands as well as prevent pollution.

The **resources** dimension of sustainable development is the broadest conceptually, dealing with both natural and man-made capital. Five issue areas included in comprehensive plans are related to the resources dimension: energy, transportation, and land-use.

4.2 Context

Planning and development occur within the context of the place, shaped by the characteristics of the jurisdiction, the characteristics of the population of that jurisdiction, and the process of planning. Each of these three groups of characteristics are described in this section along with the variables as they are operationalized for metropolitan Atlanta in this study.

4.2.1 Characteristics of the jurisdiction

4.2.1.1 Population and population growth

Population growth was found to be positive and significant on commitment to sustainable development as measured by Conroy and Berke (2004). Population was found to be positive and significant on plan quality for ecosystems in Florida Brody (2003b) but is not generally included as an independent variable. Extremely large and small populations are expected to operate under vastly different conditions (Berke and French, 1994; Berke, 1996). Small communities are found to be particularly lax in ensuring that development goals are met (Ketcham and Siegel, 1991). Several studies exclude communities with small populations, assuming that they do not have the resources to prepare or implement a high quality plan (Berke and Conroy, 2000). Smaller communities may have different needs than larger ones. Edwards and Haines (2007) evaluated the quality of smart growth plans in thirty Wisconsin towns, most of which have small populations based on traditionally agricultural economies. The findings suggest that the towns only adopted a few smart growth principles, likely because most of them are targeted at larger cities, such as creating walkable communities.

From 1980 to 2000, metropolitan Atlanta's population nearly doubled, from 2.3 to 4.3 million people. The additional 1.2 million persons added from 1990 to 2000 was second only to the growth in the New York Metropolitan Statistical Area (about 1.5 million) (U.S. Bureau of the Census, 2003). The rate of growth in the metropolitan area was faster than the state as a whole; 71% of the population increase in Georgia from 1980 to 2000 was in the metro area. As the area of focus is narrowed, though, there is a different picture. The city of Atlanta lost population from 1980 to 2000, and Fulton County's growth was not even as fast as the state as a whole. The population growth rate for the entire nation was significantly lower than that of metropolitan Atlanta (see Table 8).

Table 8: Population and Growth, 1980-2000

	1980	1990	2000	Δ1980-2000
US	226.55	248.71	281.42	24.2
GA	5.49	6.51	8.23	50.0
Metro Atlanta	2.34	3.09	4.28	82.9
Fulton County	0.59	0.65	0.82	37.8
Atlanta	0.43	0.39	0.42	-2.0

Within metropolitan Atlanta, variation in growth is striking. The mean growth was a doubling in population for both counties and cities, with both having lower medians; most counties and cities did not double their population, but some exhibited very large growth. The fastest growing county, Forsyth, increased population more than 2.5 times from 1980 to 2000, while the fastest growing city, Lovejoy (in Clayton County) exploded in population with an increase of more than 10 times. On the other hand, the slowest growing county, Meriwether, just barely maintained its 1980 population in 2000 while the slowest growing city, Braswell (in Paulding County) lost nearly 70% of its population.

Throughout the study period, the bulk of the population has been concentrated in the central counties; the four most populous counties have remained Fulton, Dekalb, Cobb, and Gwinnett with

19.2, 15.7, 14.3, and 13.9 percent of the 2000 population, respectively. Several counties on the urban fringe are home to less than one percent of the metro area's population: Butts (0.5), Dawson (0.4), Haralson (0.6), Heard (0.3), Jasper (0.3), Meriwether (0.5), and Pike (0.3).[1]

4.2.1.2 Political ideology

Political ideology has been proposed to be a factor in planning and commitment to sustainable development, but its relationship has not been determined. Political will and political support were dropped from models presented in Tang et al. (2010) and Conroy and Berke (2004). This study includes consideration of political ideology.

Based on gubernatorial elections from 1990 to 2002, metropolitan Atlanta appears almost completely balanced between democratic and republican voting behavior with a near unity ratio of votes for democratic candidates to republican candidates[2].

There is wide variation within the region, with some counties having three times the prevalence of democratic or republican votes (see Table 9). Interestingly, looking at the whole state shows a more leaning political body than in the metropolitan Atlanta area. While urban areas are often the most liberal, in three out of four of these elections, the most republican leaning county in the state was part of metropolitan Atlanta (Glascock county had a democrat to republican voting ratio of 0.42 in 1994, leaning more republican than Fayette county's 0.65).

Unfortunately, political ideology variables are not able to be constructed from similar data for cities.

4.2.1.3 Jobs available

Jobs available in metropolitan Atlanta are highly concentrated in the city of Atlanta and in a few edge cities, such as Marietta and Sandy Springs. With similar considerations, Tang et al. (2010) found commuting time to be negative and significantly affecting the quality of climate change plans.

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[1] Percent of population of metropolitan Atlanta represented by each of the counties as of the 2000 census is given in parentheses.

[2] The specific calculation is the number of votes cast in the general election for the democratic candidate divided by the number of votes cast for the republican candidate based on elections data from Georgia Secretary of State (2010). A ratio of unity indicates that the same number of votes were cast for the democratic and republican candidates while larger numbers indicate a democratic preference and smaller numbers indicate a republican preference. Third party candidates were not included.

In 1990, about 30% of workers in metropolitan Atlanta lived in a place rather than in unincorporated parts of counties. The range extended from less than 5% in rural Dawson County to more than 85% in Fulton County. In 2000, all of these fractions decreased as a higher portion of workers lived in unincorporated parts of counties across metropolitan Atlanta. In addition to more workers living in unincorporated parts of metropolitan Atlanta in 2000, a higher percent of those workers who did live within places worked somewhere else; across the region, there was a 4% decrease in working in the place of residence. Specific places (cities) ranged from zero workers working in a place in some of the smallest places to 67% in Atlanta. Other places with high percentage of workers in the same place were: Carollton, Griffin, Cartersville, and Newnan. Table 10 shows the changes.

Where people work doesn't necessarily capture the full picture of how many jobs are available, but it does show the portion of workers who are able to find work and residence in the same place. For economic development, having a variety of jobs that meet the skills and interests of the working population is important.

4.2.2 Characteristics of the population

The population characteristics are those that describe the resident population. Consumption patterns have been investigated at length on individual characteristics such as race, income, and education. These three variables are linked to other, less measurable variables, such as personal capabilities (Stern, 2000).

4.2.2.1 Race and diversity

Race has not been included in most studies of plan quality; however, race is often included as a control variable for studies of environmental concern. Dietz et al. (1998) found blacks more likely to report pro-environmental personal consumption choices. While Stern et al. (1999) found whites more likely to engage in environmental citizenship. These studies, finding race to be positively associated with pro-environmental behavior hesitate to assume that race is the causal variable - rather, race is often associated with other social and psychological variables that are not as often measured as race. The population of the metropolitan area is mostly made up of Whites and Blacks, or African Americans. Diversity in metropolitan Atlanta increased between 1980 and 2000, see

Figure 10.[3] Racial diversity increased from 1980 to 2000 in most of the individual counties and cities in metropolitan Atlanta. However, some cities are entirely white, and some cities appear to be moving from a mixed population to mostly black.

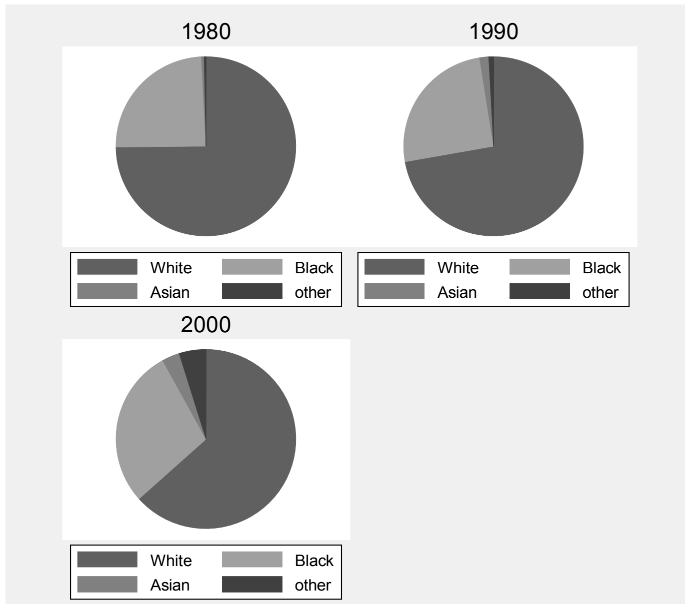

Figure 10: Racial makeup of metropolitan Atlanta

4.2.2.2 Income and poverty

Like race, income has been positively associated with pro-environmental behavior. Unexpectedly, income had a significant negative effect on inclusion of certain sprawl reducing policies in local plans (Brody et al., 2006). Income or wealth, did not have a significant affect in other models (Tang et al., 2010; Brody, 2003c,b; Conroy and Berke, 2004). Here, income is included as a contextual variable in each of the three years.

In 2000, median household income across metropolitan Atlanta was about $10,000 higher than in 1980. Real increases in median household income were seen in cities and counties, as shown in Table 11.

Income inequality in a place can mean that while some are enjoying high incomes, many are

[3]Race data in 2000 included "Asian alone" and "Native Hawaiian" instead of a combined "Asian and Pacific Islander;" as a result, I combined these two to get the "Asian" estimate for 2000.

Table 9: Political Ideology of Metropolitan Atlanta, Democratic to Republican votes (Georgia Secretary of State, 2010)

Year	State Mean	Metro Atlanta Mean	Max	Min
1990	1.19	1.04	2.07	0.56
			Meriwether	Cobb
1994	1.04	1.04	1.71	0.65
			DeKalb	Fayette
1998	1.19	1.09	2.54	0.43
			DeKalb	Forsyth
2002	0.90	1.00	3.14	0.29
			DeKalb	Forsyth

Table 10: Percent of Workers Who Lived in a Place, Metropolitan Atlanta

	Lived in a Place			Worked in Same Place		
	Mean	**Min**	**Max**	**Mean**	**Min**	**Max**
1990	0.3	0.04	0.86	0.32	0.14	0.5
	(0.17)	Dawson	Fulton	(0.11)	Clayton	Spalding
2000	0.27	0.03	0.82	0.28	0.11	0.47
	(0.17)	Dawson	Fulton	(0.1)	Clayton	Carroll

Table 11: Median household income in metropolitan Atlanta, (YR2000 USD)

Year	Mean	(Std. Dev.)	Min.	Max.
		Counties, N=28		
1980	38340.77	(8594.57)	28973.16	60744.39
1990	43229.5	(10239.3)	28094.68	69732.13
2000	48798.94	(10690.27)	32605.68	73363.81
		Cities, N=130		
1980	35575.1	(10570.05)	15431.78	69130.26
1990	38862.2	(12315.69)	19251.5	90942.14
2000	43254.72	(14465.67)	19698.75	112683.03

sharing very little income. Distribution of income is measured using the Gini coefficient; the calculation of the Gini coefficient is described in Section 5.2.1.2.

For both metropolitan Atlanta and the state of Georgia, the distribution of income became more unequal from 1980 to 2000, rising from 0.399 to 0.435 and from 0.412 to 0.458, respectively. Within counties and cities of metropolitan Atlanta, income distribution was also more unequal in 2000 than in 1980, with the highest inequalities observed in 1990 (see Table 12).

Table 12: Gini Coefficients of Income Inequality in Metropolitan Atlanta

Year	Mean	(Std. Dev.)	Min.	Max.
Counties, N=28				
1980	0.381	(0.034)	0.318	0.469
1990	0.401	(0.041)	0.342	0.53
2000	0.407	(0.038)	0.336	0.527
Cities, N=130				
1980	0.377	(0.049)	0.239	0.486
1990	0.395	(0.062)	0.269	0.621
2000	0.399	(0.068)	0.225	0.586

In 2000, 9.5% of the metropolitan Atlanta population was calculated to have income below the poverty level, an improvement over the estimated 10.4% ten years earlier. Poverty is concentrated in Atlanta and the most rural counties; In 2000, Meriwether County had a poverty rate of 17.8% (improved from 22.4% in 1990), followed by Fulton (15.7%), Haralson(15.5%), and Spalding(15.5%).[4] The lowest poverty rate in 2000 was in Fayette County at 2.6%, followed by Henry County at 4.9%.

4.2.2.3 Education

Average education attainment has been found to have a significant positive effect on plan quality (Brody et al., 2006). Metropolitan Atlanta's population is made up mostly of high school graduates (86.5%) with about one third (34%) having a bachelor's degree or higher (U.S. Bureau of the Census, 2009a). In 2000, across metropolitan counties, the range of high school graduates was 63% to 92% of adults; the highest portion of high school graduates was in Fayette County while the highest portion of college graduates was in Fulton County. For cities, the range for high school graduates was lowest in Porterdale with just 42% of the adult population, and the highest was in

[4] Poverty rate as reported here is the number of persons with income below the poverty level divided by the total number of persons for whom poverty status is determined (U.S. Bureau of the Census, 2001a, 1990).

Berkeley Lake; some two smaller cities had no college graduates, but the highest was in Avondale Estates with more than two-thirds of the population (followed closely by Berkeley Lake and Sandy Springs). Table 13 shows the details of education attainment across the Atlanta metropolitan area.

Table 13: Portion with at Least High School and College Degrees, 2000

Variable	Mean	(Std. Dev.)	Min.	Max.
		Counties, N=28		
High School	0.772	(0.079)	0.63	0.924
			Haralson	Fayette
College Degree	0.197	(0.103)	0.073	0.414
			Heard	Fulton
		Cities, N=130		
High School	0.735	(0.115)	0.415	0.977
			Porterdale	Berkeley Lake
College Degree	0.181	(0.135)	0	0.67
			Braswell[a]	Avondale Estates

a. Braswell and Talking Rock both had 0 estimated college graduates

4.2.3 Planning characteristics

Characteristics of the planning process have been described as just as important as the resulting plans; these characteristics include the experience and capacity for planning in a place, joint planning with other jurisdictions, and compliance with state planning goals. For metropolitan Atlanta, experience with planning can be roughly approximated by the number of plans and plan updates produced. Due to lack of data, capacity at the time of planning is not available for such an archival analysis, but a contemporary study (one following in real time) could measure capacity. In Georgia, the planning laws are such that compliance with state goals is a requirement for acceptance of a plan, so it makes no sense to include it. However, plans can be differentiated by their year of publication and whether or not they were developed jointly.

The most well-articulated plan could be perfectly implemented within a municipality only to fail to have a successful outcome. A failed outcome from successful implementation is possible because the outcome is dependent upon more than the municipality's plan; outcomes depend on the plans and policies of neighboring municipalities, the plans and policies of nested jurisdictions, and the other policies in place within the municipality itself. Vertical and horizontal jurisdiction coordination are necessary for successful outcomes (Innes, 1993; Bengston et al., 2004; Nelson and Duncan, 1995; Pendall et al., 2002). Burby et al. (1997) found that vertical and horizontal coordination are only two legs of a three-legged stool; another necessary leg is internal consistency - where the actions of a particular jurisdiction are in keeping with its prior planning.

Policies that are already in place can be difficult to change, and sometimes new policies may fail simply because the existing policy is conflicting. On a national scale, Brown and Chandler (2008) demonstrated several examples of policy conflicts that impede the development of clean energy technologies. Several of these effects are seen at the local scale; where incentives may not drive investment because another law prevents particular forms of investment (like not allowing private wires to cross streets) or provides a conflicting incentive (such as shorter depreciation times for inefficient equipment).

4.2.3.1 Coordination (or joint planning)

Vertical jurisdiction coordination. In Georgia, cities are nested within counties and counties are nested within regions; all are nested within the state. This is a simplified version, several cities cross county borders, and cities and counties may border others that have been divided into another region. Vertical jurisdiction coordination aids planning success because a shared vision of the future can prevent undesirable growth patterns outside of a city's or county's boundaries that conflict with growth patterns within the city or county. It can also be envisioned with another level that is the region the county and city are nested within; Georgia law requires that the regional plan be comprised of its component county plans, but a joint plan between all nested jurisdictions would be more cohesive.

Coordination between a city and the surrounding unincorporated county land is also referred to as horizontal coordination by some researchers who limit the use of the term 'vertical coordination' to the congruence between local planning and state planning goals (Burby et al., 1997; Wassmer, 2006). Taking the letter of the law, the local plans in Georgia would not be approved if they did not already coordinate with state planning goals.

Horizontal jurisdiction coordination. Horizontal coordination prevents or limits spillover; where one jurisdiction's policies may lead to unforeseen, and perhaps undesirable, actions in the boundaries of another. Neighboring municipalities which coordinate their planning for whatever shared reasons are more likely to have success with their implementation (Burby et al., 1997).

An example of spillover can be seen in the case of Boulder, Colorado as described by Pendall et al. (2002). Boulder uses both a public service area limit and a conscious greenbelt, called a "blueline" around the city to contain urban growth. This approach began in the 1960's, and it has largely worked, keeping the city area small, especially since the city has coordinated with Boulder County in its efforts (an example of vertical coordination). However, neighboring counties and cities were not so strict, and the jobs created in Boulder are filled by workers who commute across the greenbelt (Pendall et al., 2002; Morson, 1999).[5] Boulder's case is especially telling in that there was vertical jurisdiction coordination but no horizontal jurisdiction coordination - both are important for long-term success of growth management efforts.

4.2.3.2 Compliance

Having a technically compliant plan does not mean that there is local acceptance of or commitment to the goals set by the state. Hoch (2007) found that plans were almost always compliant with the letter of the law but not with the intent of the law as implementable actions at the local level (in this case for affordable housing). Perhaps "widespread resistance and grudging compliance" (p.86) is especially true in states where there is power to coerce local governments to comply with the state mandate. The use of coercion contributes a positive effect on measures of internal plan quality. Berke and French (1994) found that coercive implementation style had a positive and significant effect on fact basis and policies, but had a weaker positive effect that was not significant on the quality of plan goals.

While Georgia's planning laws are not a mandate, development and maintenance of a current plan is a condition for receiving funding - thus, the state has the power to coerce. In this light, there is the possibility that compliance is merely a facade and does not represent local commitment. Compliance cannot be measured in Georgia plans because they must be compliant to be adopted. Meaningful compliance might be better inferred through implementation studies. While plans might keep with the state planning goals, local implementation may avoid particular ones.

[5] Morson (1999) determined that fifty-five percent of jobs in Boulder are filled by employees living in satellite cities.

4.2.3.3 Time

Development is measured as change in welfare over time; making time an explicit part of the measures of sustainable development. However, time is external to measures of plan quality and commitment. As time goes on, planning quality and commitment to sustainable development may increase. In addition, later years might imply previous experience with planning. There is evidence that investment of time and energy to produce a good plan one time can continue to pay off with continually better plans. Brody (2003a) found that quality of the natural hazard portion of comprehensive plans improved over time. Improved plans imply learning by the community and planners with the most important variables being legal reform, repeated property damage, and citizen participation; however, the strongest predictor of a high quality plan in the second time period was a high quality plan initially (Brody, 2003a). Tang and Brody (2009) find the year of plan publication to be significant and positive on their measure of environmental planning quality in California. Year of publication is included in this study.

CHAPTER V

METHODOLOGY

The method used in this dissertation breaks into five parts. The first part describes different ways that results and data are presented. Then, Sections 5.2 and 5.3 describe in detail the method used to produce the sustainable development measures for metropolitan Atlanta. The third part describes the method used to identify, select, and code comprehensive plans. Lastly, Section 5.5 describes the jurisdictions for which plans are included in this study and how they relate to the whole of metropolitan Atlanta. Lastly, Section 5.6 explains the methods used to relate the planning and development results.

5.1 Presentation

Due to the complexity of representing a metropolitan region, this dissertation shows the results in multiple ways. Results are presented by the average for the metropolitan area, by regional development center, by urban tier, and by jurisdiction for particular cases. This section briefly covers these ways of looking at metropolitan Atlanta to prevent confusion when reading the methodology or results. Looking at individual jurisdictions is self-explanatory, so the concepts of an average metropolitan area, regional development center, and urban tier are described here.

Before getting into these details, it should be noted that all statistics presented in this dissertation are calculated using STATA 10. There are three datasets used: one for measures of sustainable development, one for plans, and one for the link between the two. They are maintained separately to allow for different shapes of data with relation to time and jurisdictions. The threshold for significance is 95% unless otherwise noted. All correlations are pairwise correlations which are calculated by dividing the covariance of the two variables in question by their standard deviations; if two variables are independent, their covariance, and subsequently their correlation, will be zero. When considering linear correlation results, keep in mind common errors with correlation:

1. **Correlation does not imply causality.** I do not intend to claim that one measure of welfare

causes another.

2. **Using rates or averages reduces variation that might exist between individuals.** The underlying data are essentially averages, so the variation between the average individuals examined here may be suppressing the variation between the actual individuals.

3. **Lack of a significant linear correlation does not mean that the data are not related.** Checking results with a scatter plot can show if a non-linear correlation exists.

5.1.1 Average metropolitan Atlanta

When reporting data for "metropolitan Atlanta" as a single unit, some form of averaging is necessary. From the descriptions given in Section 4.2, describing the characteristics of the metro, it is clear that metropolitan Atlanta is a diverse place. Therefore, no single number or single line on a graph will do. In this dissertation, I present the average within a 95% confidence interval to show a probable range of where the average lies.

The average of metropolitan counties is used rather than cities because counties include both the cities and unincorporated areas. It is instructive to note that the income is lower for average cities than average counties. This is not due to better jobs in unincorporated areas, rather it is a reflection of the commuting activity in the metro area. People tend to make money in the cities while they live in the unincorporated areas.

Without getting further into the concept of urban tiers (which is presented below in Section 5.1.3), the phenomenon of higher incomes in average counties than cities occurs across metropolitan Atlanta. Closer in toward the City of Atlanta - the metro center - the balance of incomes between county and city incomes is less pronounced while father out toward the edge of the metropolitan area, they are more disparate.

Even after determining that county averages should be used, there are still many options for calculating and presenting the average. One idea was to use sums of aggregate values to make up the whole metropolitan GPI measures. Such a concept implicitly weights all counties, not all people, equal in developing the metropolitan results. Figure 12 illustrates, using average per capita incomes, that the entire region appears slightly better off when the results are population weighted. The result of a higher per capita income is due to more people earning more money in highly populated places

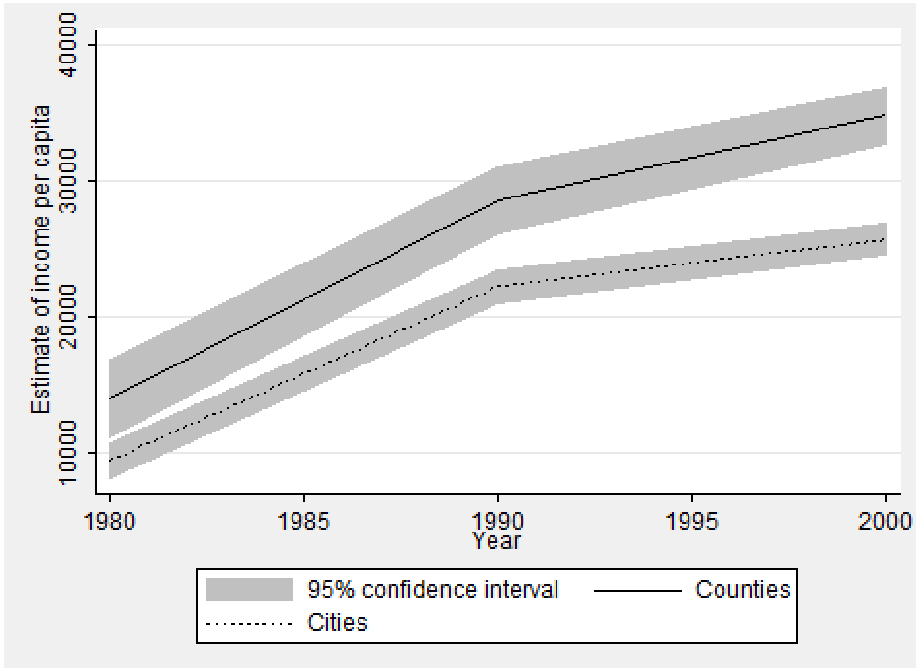

Figure 11: Income Per Capita for Metropolitan Atlanta, Cities and Counties

like Fulton county. This figure shows that the definition of the metropolitan average is important to the results. How the region is defined should be explicitly described when researchers provide information about the region to policy makers as the possibility for differences in results exists. To be explicit, then, when this dissertation refers to "metropolitan Atlanta," the results presented are a population-weighted average of county data.

This figure and other figures in this dissertation that show smoothed lines and confidence intervals show average values that are calculated using fractional polynomial predictions and a 95% confidence interval. Fractional polynomials are used to fit and compare non-linear functions. These predictions are done using STATA 10's fpfitci command. This command uses a linear regression of fractional powers of the x variable to predict the value of the y-variable. STATA selects the best fitting model of the form: $y = \beta_0 + \sum_{m=1}^{M} \beta_m x^{p_m}$ where the usual set for p_m is $\{-2, -1, -0.5, 0, 0.5, 1, 2, \}$. By default, STATA runs 8 models with $M = 1$ and 36 with $M = 2$ over the set of p_m. Graphs comparing data, income for instance, do not clearly show a better fit using linear, quadratic, or fractional polynomial methods. Figure 13 compares a scatter plot of the county per capita income with the predicted values using these three methods. The linear fit uses a linear regression of the x variable to predict y while the fractional polynomial and quadratic fit regresses the y-variable on the x-variable

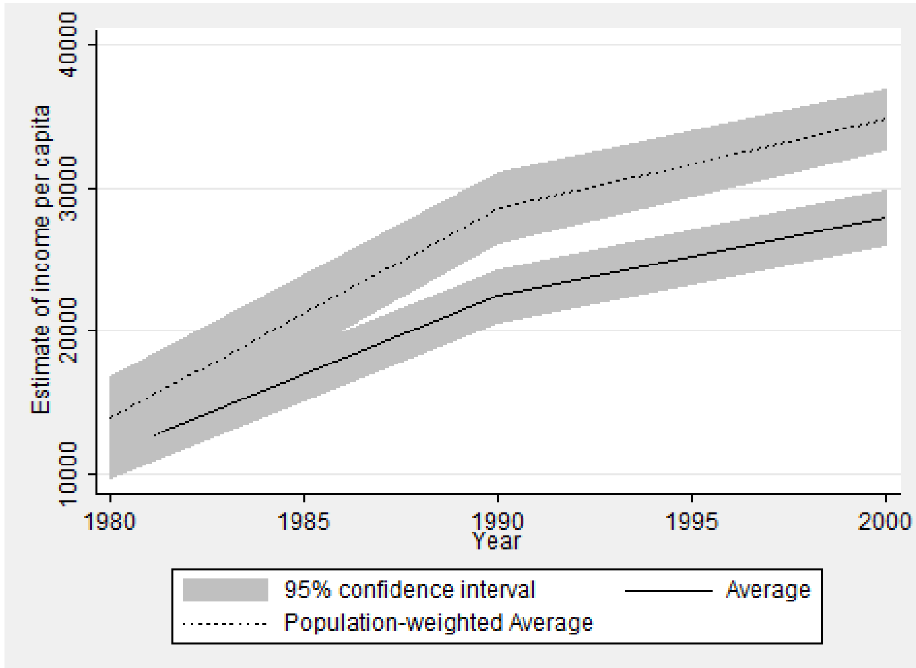

Figure 12: Income Per Capita for Metropolitan Atlanta, Population Weighted

and powers of the *x*-variable. In this dissertation, fractional polynomials were chosen because they show all the data points without distortion caused by a quadratic.

5.1.2 Regional development centers

All of one and parts of six Regional Development Centers fall within the boundaries of metropolitan Atlanta. They were described in Section 3.4.3. Figure 14 shows the counties in the Atlanta-Sandy Springs-Marietta, Georgia Metropolitan Statistical Area by RDC number: 1 - North Georgia, 2 - Coosa Valley, 3- Atlanta Regional Commission, 4 - Georgia Mountains, 5 - Northeast Georgia, 6 - McIntosh Trail, and 7 - Chattahoochee Flint. For cities within each Regional Development Center, refer back to Tables 6 and 7.

5.1.3 Urban tiers

Tiers are simply another way of organizing a metropolitan region which is more generalizable to other metropolitan regions. In this dissertation, I use urban tiers to separate the urban core from the first suburban ring and the urban fringe counties (see Figure 15). This sort of breakdown is especially helpful since the Metropolitan Statistical Area of Atlanta-Marietta-Sandy Springs, Georgia is

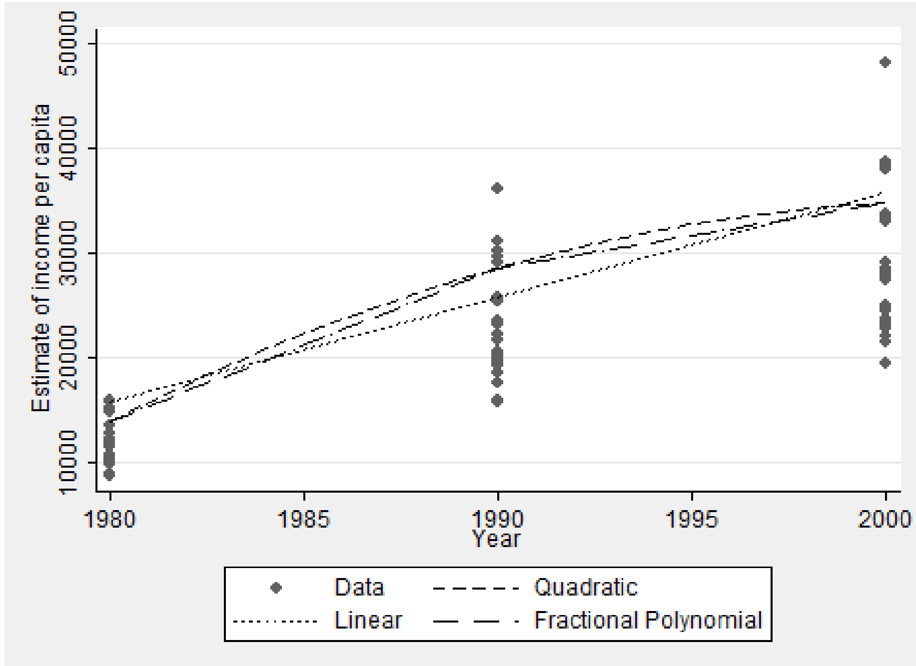

Figure 13: Income Per Capita for Metropolitan Atlanta, Methods of Averaging

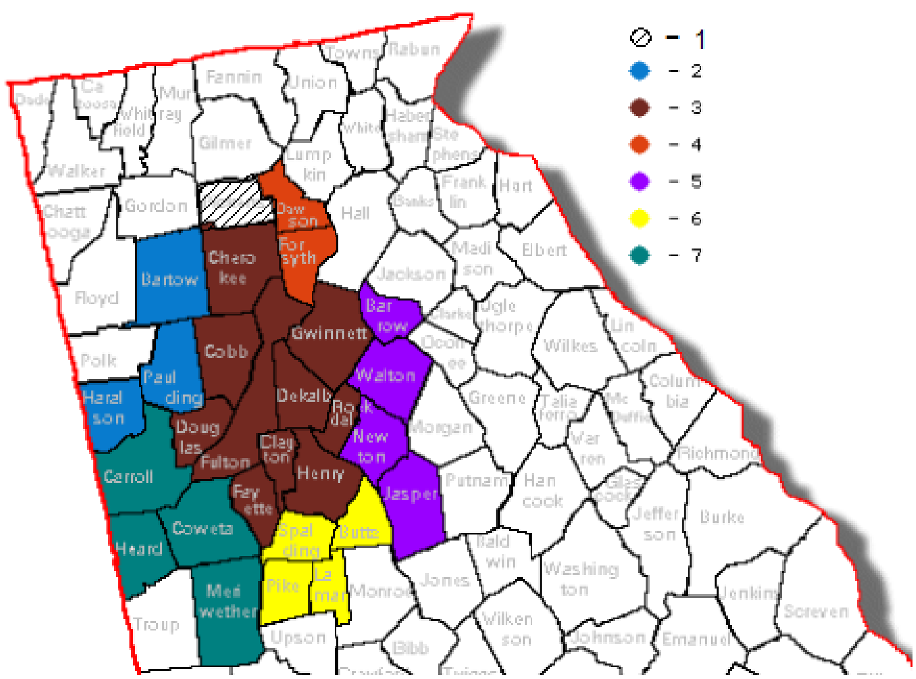

Figure 14: Metro counties by RDC

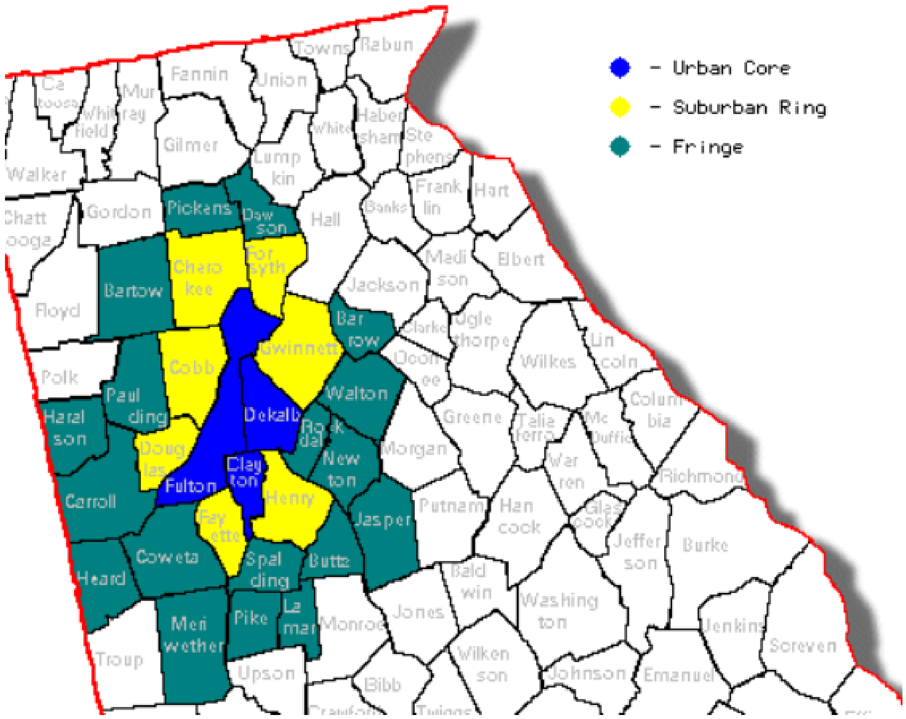

Figure 15: Urban tiers of metropolitan Atlanta

characterized by a highly concentrated urban core moving out to largely rural areas. The urban core is made up of places in Fulton, DeKalb, and Clayton counties. The first suburban ring is made up of places in Cherokee, Cobb, Douglas, Henry, Fayette, Forsyth, and Gwinnett counties. The urban fringe of metropolitan Atlanta includes places in Barrow, Bartow, Butts, Carroll, Dawson, Haralson, Heard, Jasper, Lamar, Meriwether, Newton, Paulding, Pickens, Pike, Rockdale, Spalding, and Walton counties.[1] If comparing the urban tiers to the RDCs, the core and suburban ring almost make up the Atlanta Regional Commission, including Forsyth instead of Rockdale county. Counties in all other RDCs are part of the fringe.

These three tiers have distinct overall patterns of growth during this time. The urban core (tier 1) is highly populated with average or slow growth compared to the whole metro. The suburban ring (tier 2) has average population, but fast growth. Lastly, the urban fringe (tier 3) is average to low population with average to low or negative growth. Other metropolitan areas may have similar

[1]The use of the urban tier system is borrowed from the Environmental Protection Agency, but modified to better reflect the realities of small counties in Georgia.

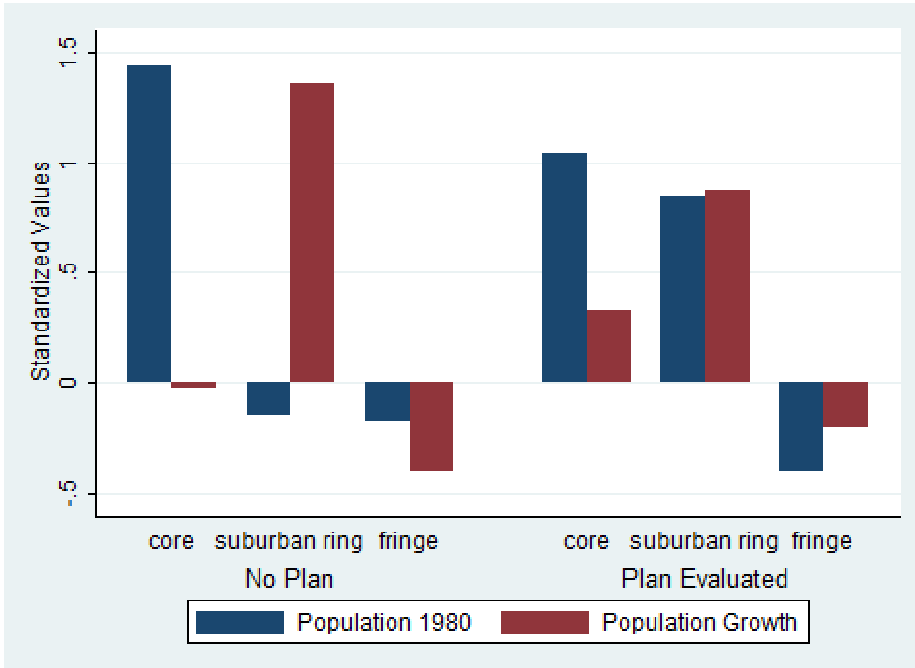

Figure 16: Population and growth by tier, with and without plans

development profiles. Figure 16 shows two sets of bar charts; on the left, the development patterns just described for tiers are shown for all jurisdictions. On the right, the jurisdictions from each of those tiers for which plans are evaluated in this dissertation are shown. The development patterns for those places with plans do not adequately represent the tiers.

To enable discussion by these general growth patterns, the jurisdictions in Atlanta were clustered by standardized vales of population in 1980 and population growth over the study period. Population and population growth variables were standardized separately for cities and counties to achieve means of zero and a standard deviation of one. Using Ward's method, the 158 jurisdictions break down into three major clusters as shown in Figure 17. Ward's method of clustering is hierarchical, beginning with each individual as a cluster and successively clumping clusters together, minimizing the error sum of squares at each step (Ward, 1963). Three distinct clusters appear using this method as represented by their euclidean distance on the y-axis of Figure 17. To give some idea of which places are in each cluster, this dendrogram shows 50 jurisdictions of 158.

Figure **??** shows that the jurisdictions with plans evaluated in these clusters are representative of

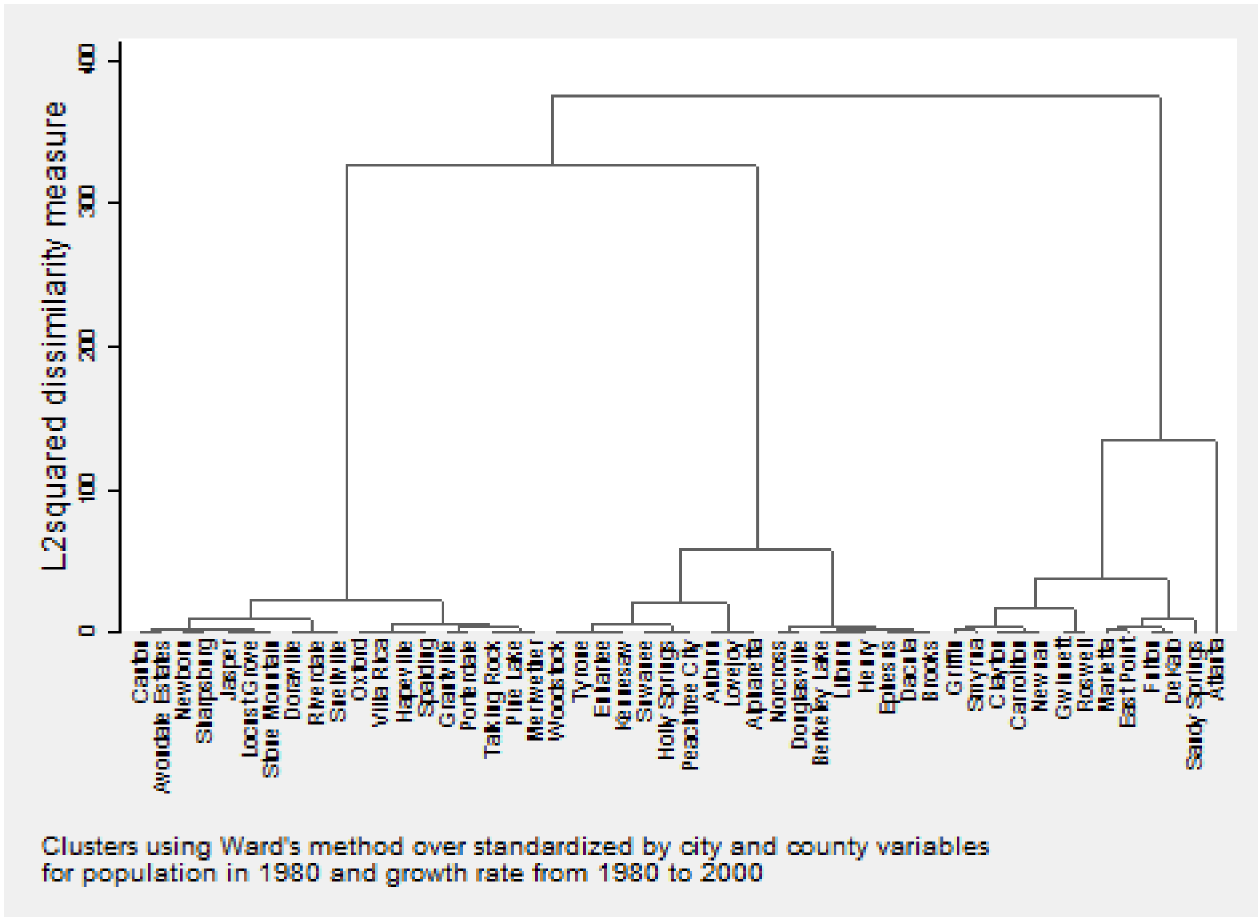

Figure 17: Dendrogram of Atlanta by growth pattern cluster

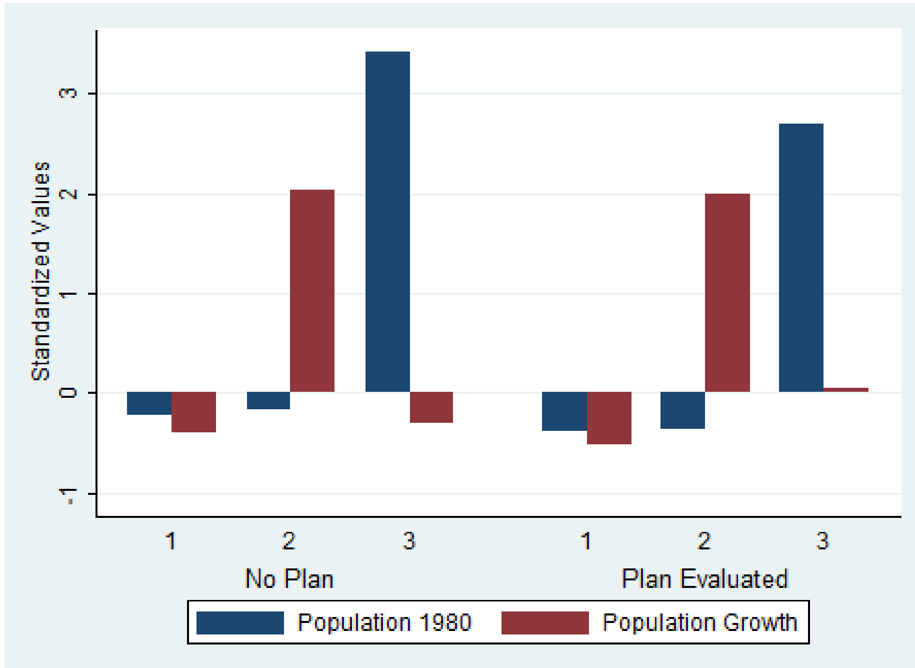

Figure 18: Population and growth in clusters, with and without plans

the growth patterns of interest. These three clusters will be referred to as patterns: 1)low population-moderate growth, 2)moderate population-fast growth, and 3)high population-slow growth in reference to their starting population and growth. Note that these correspond well with the urban fringe, suburban ring, and urban core presented in Figure 16. A portion of the results section will focus on the planning and development in these clusters.

5.2 Measuring GPI

Measuring the GPI for a place involves collecting primary data from multiple sources and, in many cases, imputing a resulting variable based on known or expected relationships. As the target study area becomes more refined, specific data become less available, and weighting based on a larger geographic area, be it county, state, or nation, is required. Here, each of the twenty-five component factors of the GPI are described with their equations and data source. Figures are provided for each measure showing the per capita calculation results for the state of Georgia, the population weighted average of metropolitan Atlanta's 28 counties (shown as a fractional polynomial with a 95% confidence interval), and the City of Atlanta; these figures are included to provide perspective on the range of values.

They are grouped under the four dimensions of sustainable development: Economic - which includes income, underemployment and non-market labor, Social - costs of social decline, Environment - measures of environmental damage, and Resources - natural and built, or man-made, capital. For comparison to other published studies using the GPI, I have retained their alphabetic labels as well. A concise but detailed summary of this section can be found in Appendix B.1.

5.2.1 Economic

5.2.1.1 A: Personal income

Personal consumption is the starting point for calculating welfare in the current GPI method (Talberth et al., 2007). However, personal consumption is calculated as a percentage of personal income using an expenditure to income ratio. Income data are available at all levels from the U.S. Census Bureau; however, data on consumption is not available except at the national and metropolitan level. Because the definition of the Atlanta metropolitan region changed over the course of the study, it is not possible to reconcile the differences, and national income:consumption ratios would need to be used on local income data. This presents two problems: first, I disagree with consumption as a starting point because if savings go down, the large positive starting value of consumption goes up relative to income, but no one would argue that saving less is a good idea for sustainability; second, using the national income:consumption ratio provides no differentiation at the local level and introduces error where some places may have a higher or lower savings rate. Instead, I use personal income as a starting point and recognize that personal consumption would be a lower number.

$$A = PI_{i,t} \tag{1}$$

- $PI_{i,t}$ Aggregate personal income is based on the population and per capita income from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990, STF3, P114A; U.S. Census 2000, SF3, P82

5.2.1.2 B: Income inequality

Income inequality is measured with the Gini coefficient. The Gini coefficient is a representation of the relative distribution of values. It can be calculated by dividing the area between a line of equal

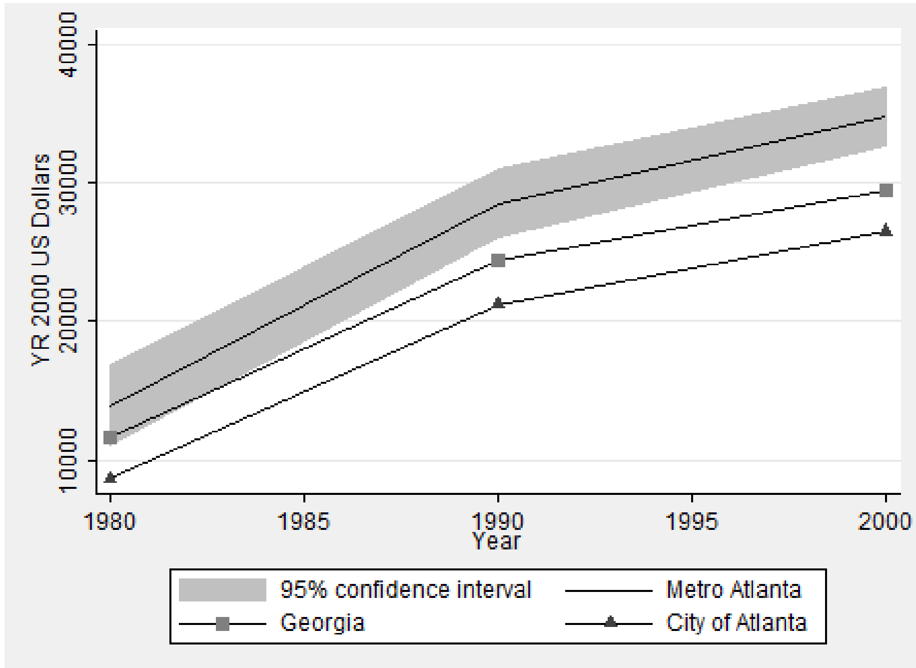

Figure 19: Per capita income (A), selected geographies

income distribution and the Lorenz curve of the actual distribution by the total area beneath the equal line (Gini, 1912). A representation of this measure is shown in Figure 20 and the corresponding formula as Equation 2 which depends upon the area of each section under the line of equality.

$$G = \frac{A}{A + B} \tag{2}$$

If the Lorenz curve representing the actual distribution were to lie on the equal income distribution line, there would be perfect equality in distribution, and the Gini coefficient would be zero; conversely, if the Lorenz curve were to stretch out to fill the triangle of space below the line of equal income distribution, all of the income would be held by just one household, and the Gini coefficient would be one.

It is most direct to calculate the area of **B** based on the percentage of the population and income at each step and then to subtract that value from the value of the area of the triangle under the line of perfect equality to obtain a value for **A**. To enable the efficient calculation of the many Gini coefficients necessary for this study, the open source computer program R was used (R Development Core Team, 2010). In the program R, the function gini(x) in the *ineq* library is applied to a dataset

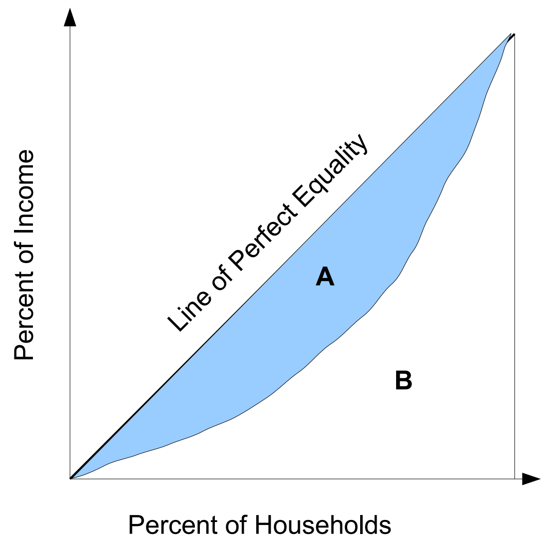

Figure 20: Sketch example of Gini concept

of x's and y's where the x's are the mean incomes within income classes and the y's are the corresponding population proportions within those classes for each geography. Income inequality based on the Gini coefficient can be compared across geographies with lower values representing more equal distributions of income.

Note, the present study differs from previous measures of GPI because I am using the Gini coefficient directly instead of an index. Using the coefficient will reduce the starting point of consumption, see Section 5.2.1.3 below, but it allows comparison both across space and time, alleviating a constraint on the GPI.

- $I_{i,t}$ Income classes and population proportions within those classes are from: U.S. Census 1980, Missouri Census Data Center stf803x2;U.S. Census 1990, STF3, P080;U.S. Census 2000, SF3, P52

5.2.1.3 C: Adjusted personal income

Adjusted personal income is personal income adjusted for changes in income inequality.

$$C = API_{i,t} = PI_{i,t} \times (1 - IG_{i,t}) \tag{3}$$

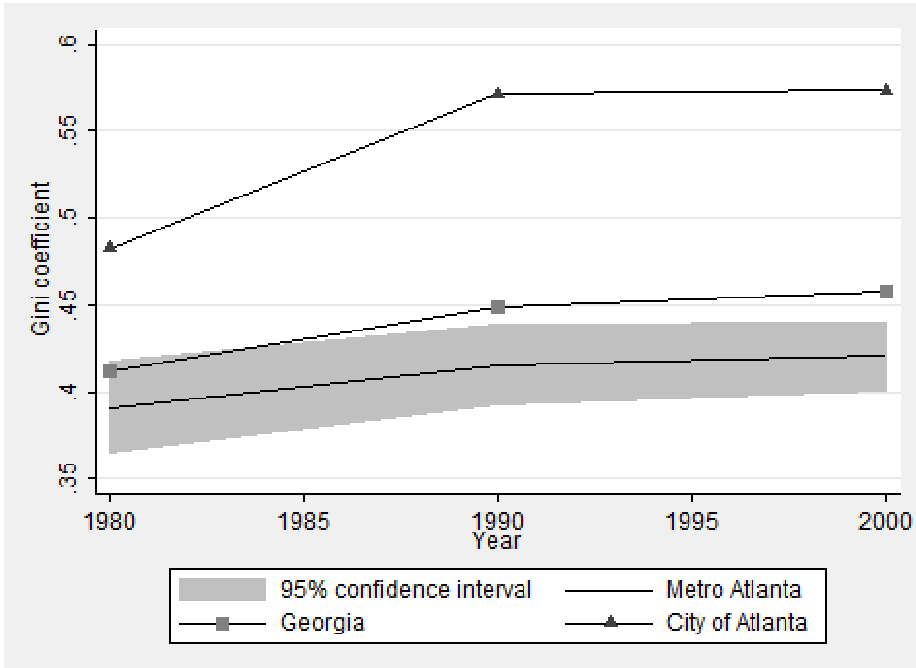

Figure 21: Per capita Gini coefficient (B), selected geographies

where: $PI_{i,t}$ Aggregate personal income in place i at time t

$IG_{i,t}$ Gini coefficient for income in place i at time t

For the source of data, see Sections 5.2.1.1 and 5.2.1.2, above.

5.2.1.4 D: Value of household labor

The value of household labor is measured as the cost a household would have to pay for the amount of household labor performed, unpaid, by its adult members. Using time spent on household labor from the National Time Use and Current Population Surveys, national averages are calculated for four groups: male and female employed and unemployed persons (Ramey, 2009). The amount of household labor in a place is then calculated by population weighting among these four groups. Differences in household labor participation in different places is muted by this method.

Table 14: Hours of Household Labor per Week by Person Type (developed from data in Ramey (2009, Tables 6 & 7))

	Employed Women	Unemployed Women	Employed Men	Unemployed Men
1970	22.77	44.91	10.97	17.87
1980	23.93	43.12	12.33	18.91
1990	25.09	41.34	13.69	19.95
2000	26.25	39.56	15.05	20.99

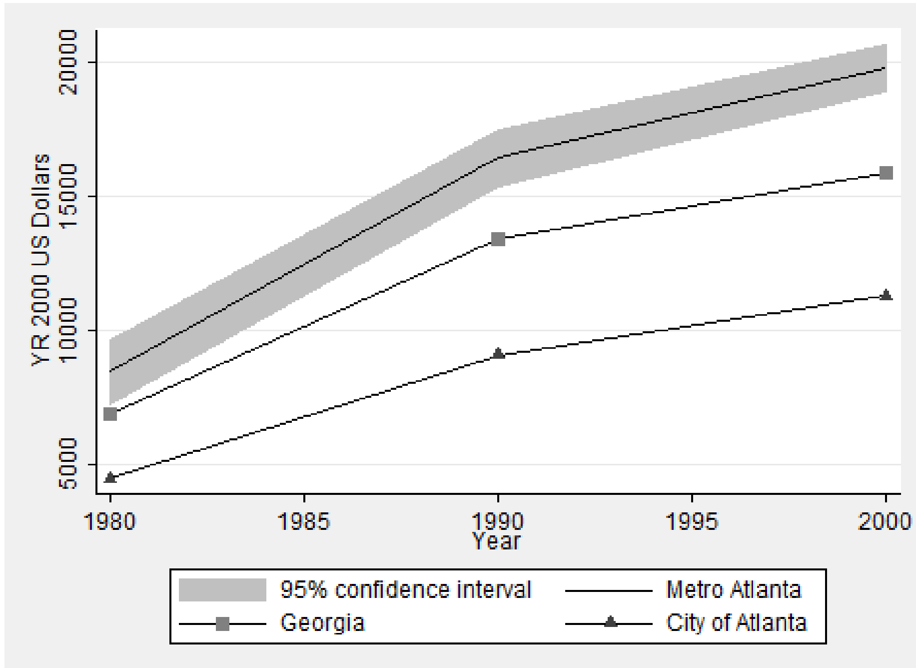

Figure 22: Per capita income adjusted for inequality (C), selected geographies

$$D = VHL_{i,t} = WM_{i,t} \sum_{j=1}^{4} HL_{j,t} * p_{i,t,j} \tag{4}$$

where:

$VHL_{i,t}$	Value of household labor in place i at time t
$WM_{i,t}$	Wage of maid in place i at time t
$HL_{j,t}$	Hours of household labor per year by group j at time t
$p_{i,t,j}$	Number of people in group j in place i at time t

- $WM_{i,t}$ Maid wage is based on mean wages from year 1997, 1998, and 1999 wages for SOC code 37-2012 "Maids and Housekeeping Cleaners" as reported by 1999 National Occupational Employment and Wage Estimates; Building and Grounds Cleaning and Maintenance Occupations. Median maid wages in the U.S., Georgia, and Metropolitan Atlanta were \$7.46, \$7.04, and \$7.52, respectively with a mean standard error of 0.3%.

- $HL_{j,t}$ Forecasted using Ramey (2009) data for weekly household labor, 1900 to 2005, see Table 14.

- $p_{i,t,j}$ Population figures are from employment status by sex for population 16 years and older tables from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990, STF3, P080; U.S. Census 2000, SF3, P43. Employed persons includes the armed forces and employed civilian labor force; unemployed includes the non-institutionalized population that is unemployed and not in the labor force.

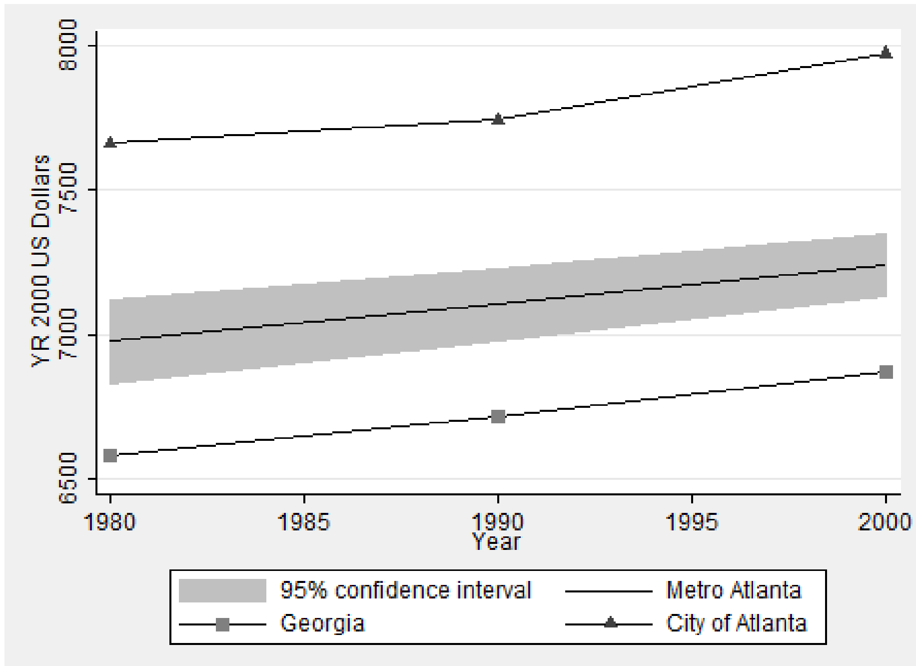

Figure 23: Per capita value of household labor (D), selected geographies

5.2.1.5 E: Value of volunteer work

The value of volunteer work is measured as the cost of providing the services provided by volunteers, unpaid. This value is based on the differing volunteer rates of individuals with different levels of education. For the years 1989 through 2008, education is positively correlated with the propensity to volunteer; more than thirty percent of people with college degrees volunteered while less than ten percent of adults with less than a high school diploma volunteered (see Table 15). The average hours volunteered per year for those who volunteer is 50 to 60 hours.

Because the data are only for the population aged 25 years and older, volunteering by the younger population is excluded. Volunteerism by persons younger than 25 has been increasing, but lack of data prevents calculations of the value of the volunteer labor provided by these people (Office of Research and Policy Development, 2007).

Table 15: Percent of people who volunteer by level of education and average hours volunteered for those who volunteer (Hayghe, 1991; Office of Research and Policy Development, 2007, 2008)

	Percent volunteered			
Education level	1989	2003	2008	hours
Less than HS diploma	8.3	9.9	9.0	50
HS diploma	18.8	21.7	18.6	52
Some college	28.1	34.1	30.7	52
Associates degree or higher	38.4	45.6	41.8	60

$$E = VV_{i,t} = \sum p_{i,j,t} \times PV_j \times HV_j \tag{5}$$

where:

$VV_{i,t}$ Value of volunteering in place i at time t

$p_{i,j,t}$ Population in an education class j in place i at time t

$PV_{j,t}$ Percent of an education class j who volunteer, on average, at time t

HV_j Median hours volunteered by an education class j for those who volunteer per year

- PV_j Percent volunteered by education status is based on 1989 values presented by the Bureau of Labor Statistics for 1980 and 1990 and 2003 values from Volunteering in America 2007 for 2000 (Hayghe, 1991; Office of Research and Policy Development, 2007)

- HV_j Hours volunteered for those who volunteer is based on data provided in Volunteering in America 2007.

- $p_{i,t,j}$ Population figures are from educational attainment for population 25 years and older tables from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990, STF3, P057; U.S. Census 2000, SF3, P37

5.2.1.6 *K: Cost of underemployment*

The Bureau of Labor Statistics has developed six measures of unemployment that are now tracked and published together. These measures of unemployment range from the percent of the labor force currently collecting unemployment benefits and looking for work to the percent of the labor force that is underemployed. Underemployment is a related concept to unemployment, but it captures those who are working less than desired and those who have given up looking for work in addition

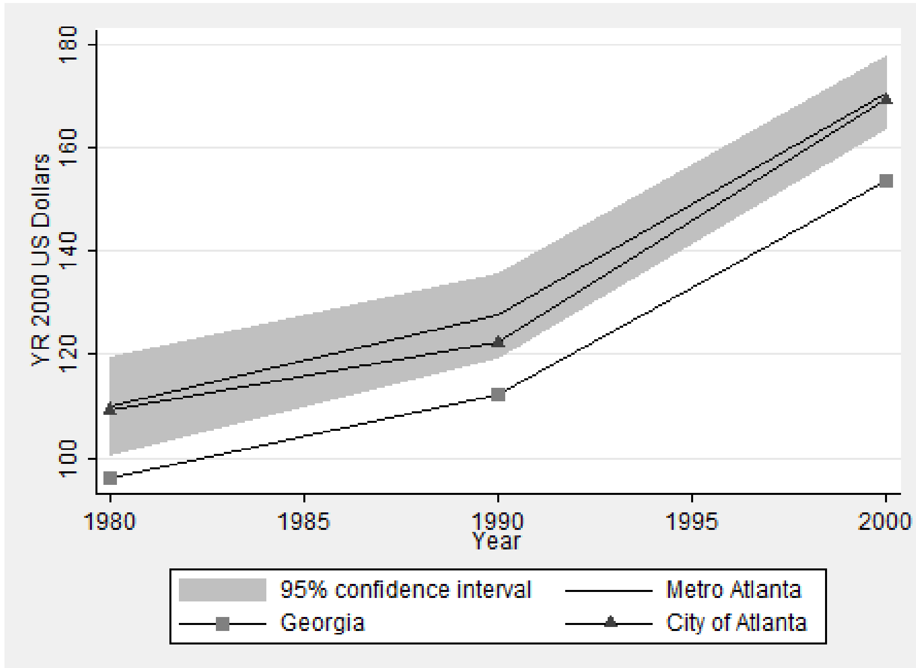

Figure 24: Per capita value of volunteer labor (E), selected geographies

to those traditionally counted as unemployed. In 2000, the unemployment rate for the whole United States was four percent while the full underemployment rate, as used in this analysis, was seven percent. According to estimates by Leete-Guy and Schor (1992), unprovided hours grow on the order of 0.59 percent per year from 1969 to 1989; unfortunately, newer estimates are not available.

$$K = CUE_{i,t} = \frac{UH_{n,t}}{NW_{n,t}} \times NUE_{i,t} \times W_{i,t} \qquad (6)$$

where:

$CUE_{i,t}$	Cost of underemployment in place i at time t
$UH_{n,t}$	Unprovided hours, nationally, at time t
$NW_{n,t}$	Number of workers, nationally, at time t
$NUE_{i,t}$	Number of underemployed in place i at time t
$W_{i,t}$	Average wage in place i at time t

- $UH_{n,t}$ Unprovided hours from Leete-Guy and Schor (1992) are used to impute unprovided hours data for 1980, 1990, and 2000.

- $NW_{n,t}$ The number of workers is from data tables on sex by employment status: U.S. Census

1980, Missouri Census Data Center stf803x2; U.S. Census 1990, STF3, P070; U.S. Census 2000, SF3, P43

- $NUE_{i,t}$ The number of underemployed in each place is derived from a national ratio of unemployed to underemployed and the local unemployed population. Number of unemployed is from data tables on sex by employment status: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990, STF3, P070; U.S. Census 2000, SF3, P43

- $W_{i,t}$ The average wage for the state of Georgia is used.

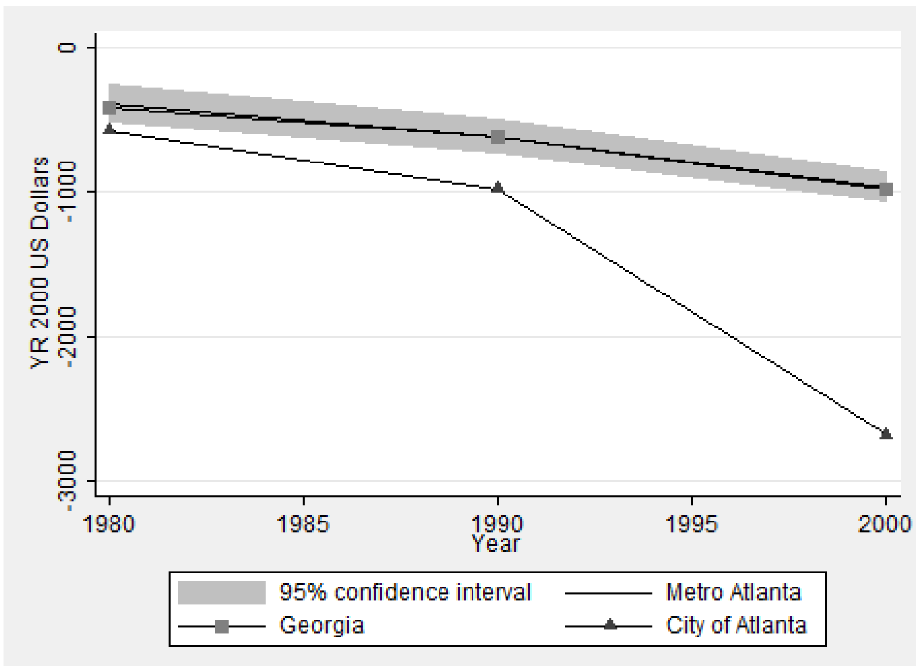

Figure 25: Per capita cost of underemployment (K), selected geographies

5.2.2 Social

5.2.2.1 H: Cost of crime

The cost of crime captures the tangible costs of seven types of crime. The frequency of crime types is multiplied by the tangible costs, based on a national average, of that type of crime. The current GPI methodology and recent local applications of this method count tangible costs of crime as direct costs and also calculate defensive expenditures on household security, locks, and safe deposit boxes as indirect costs of crime (Talberth et al., 2007). However, these defensive purchases are already included in the costs of durable goods, so I have excluded them to avoid double counting.

$$H = CCr_{i,t} = \sum_{7}^{v=1} TCCr_v \times RCr_{v,t} \times pi, t \tag{7}$$

where:

$CCr_{i,t}$	Cost of crime in place i at time t
$TCCr_v$	Tangible costs of crime of type v
RCr_v	Rate of crime of type v at time t
pi, t	Population in place i at time t
v	Type of crime

- $TCCr_v$ The tangible costs of crime by crime type are from Miller et al. (1996), see Table 16.
- RCr_v The crime rate by type is from the Federal Bureau of Investigations, which reports crime by Metropolitan Statistical Area and state. The Atlanta MSA consisted of only 20 counties in 2000 compared to the 28 counties today, so the metropolitan rates are used for the counties and cities in the 20 county area. For counties outside of the 20 county area, rural crime rates for the state of Georgia are used; for cities outside of the 20 county area, crime rates for cities outside of metropolitan areas are used. See Table 16.
- $p_{i,t}$ Population data from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990; U.S. Census 2000

5.2.2.2 I: Cost of family breakdown

The cost of family breakdown is based on the cost of divorce. In the 2006 GPI methodology also included a cost for time spent watching television; however, it is excluded from this study because time spent watching television hasn't changed much over the last twenty years, and there are so many other media in our lives now.

$$I = CFB_{i,t} = \left(CD + CDPC \times \left(\frac{Ch}{D}\right)_{i,t} \times \left(\frac{MW}{MW + MWo}\right)_{i,t} \right) \times DR_{i,t} \times p_{i,t} \tag{8}$$

where:

Table 16: Tangible Costs per Crime and Crime Rates (Miller et al., 1996; Federal Bureau of Investigations, 2000)

	Murder and non-negligent manslaughter	Forcible rape	Robbery	Aggravated assault	Burglary	Larceny-theft	Motor vehicle theft
	Cost per crime (YR2000 USD)						
	3213000	6069	2737	1845	1309	440	4165
	Crime Rate (per 100,000)						
Georgia	8	24	162	311	837	2937	473
Metro	8	26	200	298	873	3048	582
Rural	4	10	21	164	476	1179	138
Non-metro cities	8	27	129	484	850	3847	236

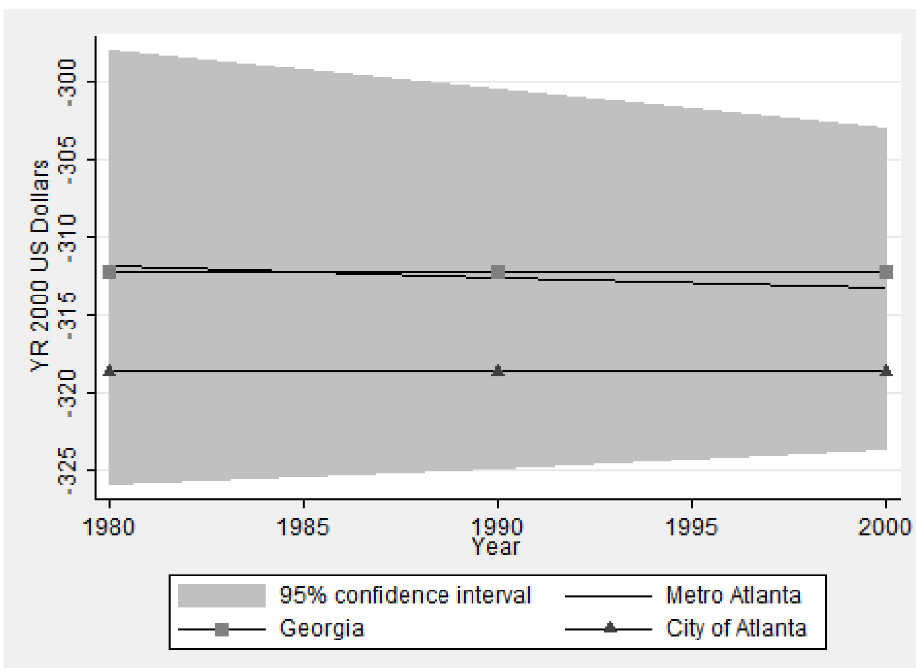

Figure 26: Per capita cost of crime (H), selected geographies

$CFB_{i,t}$	Cost of family breakdown in place i at time t
CD	Cost per divorce
$CDPC$	Cost per divorce per child
$\left(\frac{Ch}{D}\right)_{i,t}$	Number of children per divorce in place i at time t
$\left(\frac{MW}{MW+MWo}\right)_{i,t}$	Portion of married families with children under the age of 18 in place i at time t
$p_{i,t}$	Population in place i at time t

- CD The cost per divorce used is \$8922 YR2000 dollars based on Anielski & Rowe (1999) and studies in Ohio, VT, and MD

- $CDPC$ The cost per child per divorce used is \$13,380 YR2000 dollars based on Anielski & Rowe (1999) and studies in Ohio, VT, and MD

- $\left(\frac{Ch}{D}\right)_{i,t}$ The number of children per divorce is a state-specific (but not more refined) value derived from tables of numbers of divorces involving children. The tables report number of divorces involving 1, 2, 3, 4, and 5 or more children, and an average number of children per divorce involving children is derived (National Center for Health Statistics, 1983, 1995). Based on this data, the average number of children per divorce (considering marriages with and without children) is lower for all years in Georgia than in the U.S. as a whole with 0.8 children compared to 0.9 children. For those divorces involving children under the age of 18 in Georgia, an average of 1.6 children are involved.

- $\left(\frac{MW}{MW+MWo}\right)_{i,t}$ The ratio of married couples with and without children is used to ensure that the number of children per divorce is only applied to that portion of married couples who have children. Data on marriages with and without children are from Household size by household type by presence of own children under 18 years tables from U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990; U.S. Census 2000 Table P10.

- $DR_{i,t}$ The divorce rate is state-specific (but not more refined) from National Center for Health Statistics (1983, 1995).

- $p_{i,t}$ Population data from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990; U.S. Census 2000

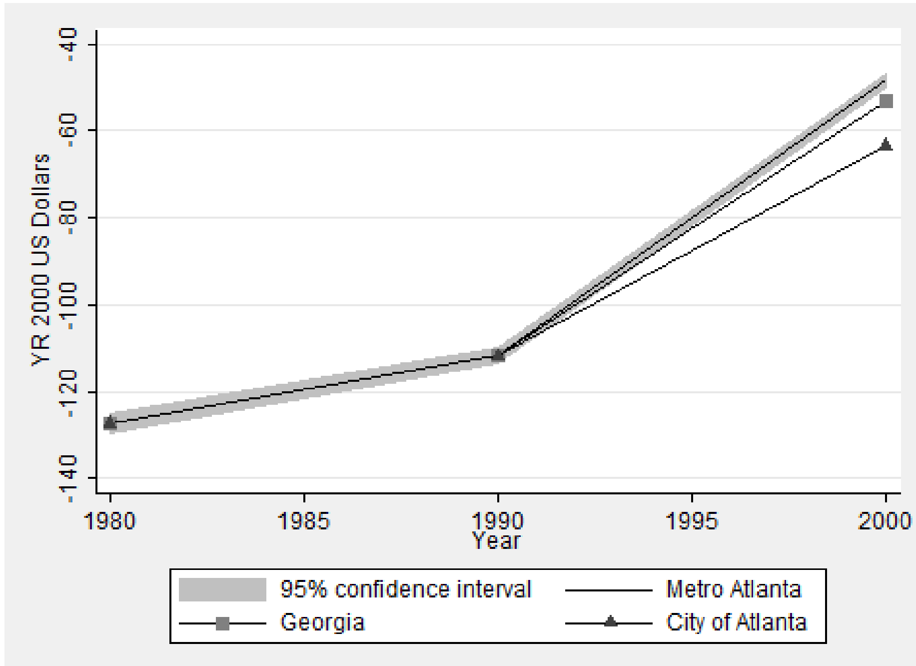

Figure 27: Per capita cost of family breakdown (I), selected geographies

5.2.2.3 J: Cost of loss of leisure

The idea is to reclaim the cost of time spent working in time t that was not spent working in time t_0. In this study, t_0 is 1980 because it is the first year where the GPI is calculated. Therefore, the value of loss of leisure time will be negative if more time is spent working than in 1980 and it will be positive if less time is spent working than in 1980; for 1980, the value is exactly zero.

$$J = CLL_{i,t} = W_{i,t} \times \left[DHW_{i,t=1980} - \left(DHW_{tot} - \frac{HWagg_{i,t}}{NW_{i,t}} \right) \times NW_{i,t} \right] \quad (9)$$

where:

$CLL_{i,t}$	Cost of lost leisure in place *i* at time *t*
$W_{i,t}$	Wage in place *i* at time *t*
$DHW_{i,t}$	Discretionary hours per worker in place *i* at time *t*
DH_{tot}	Constant value of 3650 hours
$HWagg_{i,t}$	Aggregate hours worked in place *i* at time *t*
$NW_{i,t}$	Number of workers in place *i* at time *t*

- $DHW_{i,t}$ The discretionary hours "lost" is calculated as the difference in discretionary hours not spent working from 1980 to year *t*. Discretionary hours not spent working is calculated by subtracting hours spent working in a year from an estimated 3650 discretionary hours, those not spent sleeping or engaging in other maintenance activities.

- $HWagg_{i,t}$ Aggregate hours spent working and hours spent working per worker is from data tables of sex by work status by usual hours worked by weeks worked for the population 16 years and older: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990, STF3, P076; U.S. Census 2000, SF3, P47

- $NW_{i,t}$ The number of workers is from data tables on sex by employment status: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990, STF3, P070; U.S. Census 2000, SF3, P43

5.2.2.4 M: Cost of commuting

In the most recently published manual for calculating the GPI, the cost of commuting included the direct costs of transportation - calculated as 30% of the cost of personal vehicles and 30% of the public costs of public transportation - and the indirect costs of time spent commuting. However, the cost of vehicles and public transportation are included elsewhere as consumer durables and capital investment. In the present study, only the indirect cost of time spent commuting is used to avoid double counting.

Using job search and moving data for The Netherlands, Van Ommeren and Fosgerau (2009) found a marginal cost of commuting to be about 17 YR2008 euros; this marginal costs includes a

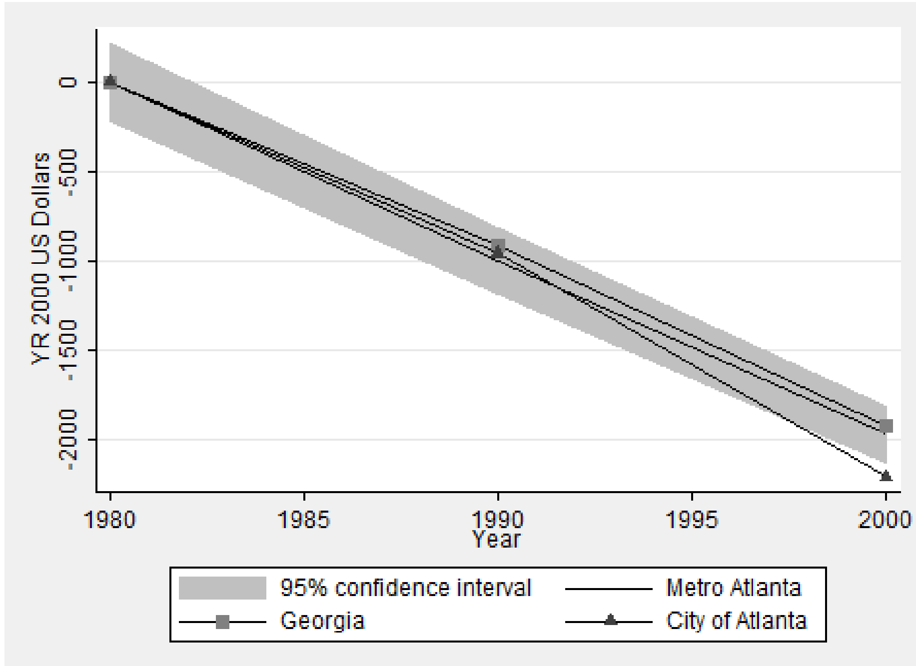

Figure 28: Per capita cost of loss of leisure (J), selected geographies

Table 17: Average estimates across all Georgia counties and cities

	1980	1990	2000
Average Hourly Cost of Commuting	\$6.48	\$7.36	\$8.50
Average Hourly Estimate Wage Rate	\$9.72	\$11.03	\$12.75

real cost estimated at 40% of the cost of time, translating to a cost of time of about 11.60 YR2000 USD. Their estimate is a little higher than the average value used in this study.

Time spent commuting has been considered to be part work and part leisure, so previous studies of GPI have used a reduced wage rate. For this study, the estimated wage rate is determined by dividing the aggregate income by the size of the employed labor force and an estimated 2000 work hours per year; the use of aggregate income instead of wages drives this value above the actual wage rate. The reduced wage rate for the time cost of commuting is then two-thirds of this estimated wage rate. Table 17 shows both the estimated average wage rate and the average reduced hourly rate used for the time cost of commuting in this study. Each place has its own time cost of commuting calculated by its own income.

$$AMW_{i,t} = \sum_{a=1}^{n} MW_a \times p_{i,t,a} \tag{10}$$

$$AHC_{i,t} = \frac{2(trips)}{1(day)} \times \frac{250(days)}{1(year)} \times \frac{1(hour)}{60(minutes)} * AMW_{i,t} \tag{11}$$

$$M = CC_{i,t} = AHC_{i,t} \times HCC_{i,t} \tag{12}$$

where:

MW_a	Mean of minutes to work span, a
$p_{i,t,a}$	Count of people reporting a journey to work within a span a in place i at time t
$AMW_{i,t}$	Aggregate minutes to work in place i at time t
$AHC_{i,t}$	Aggregate hours commuting in place i at time t
$CC_{i,t}$	Cost of commuting in place i at time t
$HCC_{i,t}$	Hourly cost of commuting in place i at time t

- MW_a **&** $p_{i,t,a}$ **&**$AMW_{i,t}$ Mean minutes to work span and people with a commute within a span based on tables of travel time to work for workers 16 years and older from: U.S. Census 1980, Missouri Census Data Center stf803x2 and U.S. Census 2000, SF3, P31. For 1990, the aggregate travel time to work in minutes is used from U.S. Census 1990, STF3, P051. In 2000, there were twelve travel time to work spans reported, ranging from less than five minutes to greater than ninety minutes. For each time span, the average was used as the travel time for all workers in the span, with the exception of the end points. For less than five minutes, a time of 2.5 minutes was used while for greater than ninety minutes, ninety minutes was used. This method could bias the results if the internal time spans did not have a normal distribution or there were much longer commute times than ninety minutes for the higher end group.

- $HCC_{i,t}$ Based on two-thirds of average hourly wage rate, as described above.

5.2.2.5 O: Cost of auto accidents

One of the costs of traveling to and from work, shopping, and recreation is auto accidents. So, while citizens benefit from the value provided by the services of streets and highways (see Subsection 5.2.4.1), they are harmed by accidents incurred on these streets and highways. Because of the difficulty of collecting data on the extent of other travel services, only road accidents are considered. This includes the injuries and damages to pedestrians and bicyclists when they collide with vehicles, but not when they might have other accidents and injuries by these alternate modes of travel.

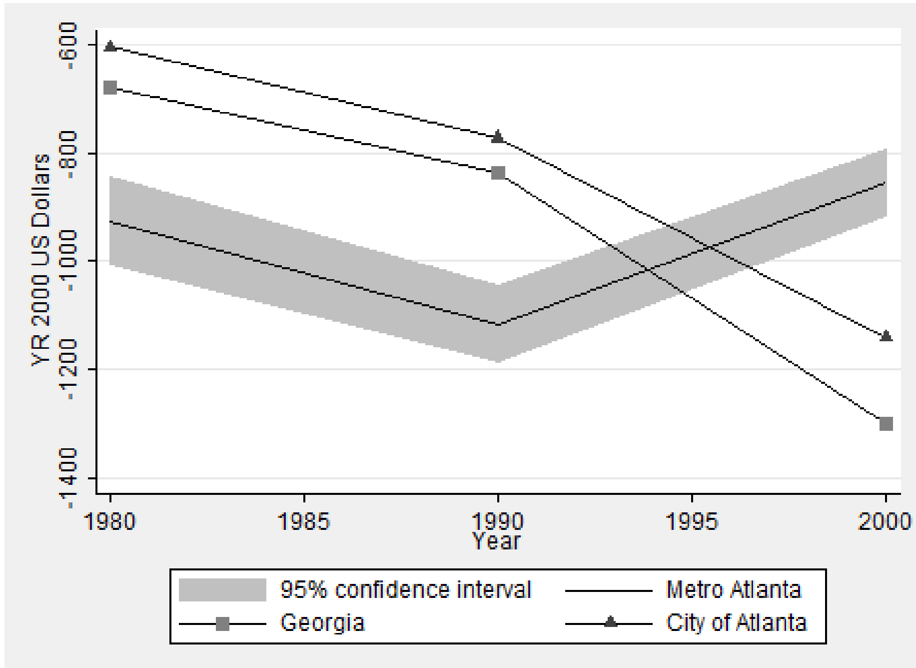

Figure 29: Per capita cost of commuting (M), selected geographies

$$O = CAA_{i,t} = \sum_{3}^{j=1} NAA_{i,j,t} \times CPAA_j \tag{13}$$

where:

$CAA_{i,t}$	Cost of auto accidents in place i at time t
j	Type of auto accident: fatal, non-fatal injury, property damage only
$NAA_{i,j,t}$	Number of accidents of type j in place i at time t
$CPAA_j$	Tangible cost per accident of type j

- $NAA_{i,j,t}$ Numbers of accidents are reported by type for the state of Georgia and the United States for 2000 by the National Highway Traffic Safety Administration. For counties in Georgia, crash data by type is available for 2000 from Georgia Department of Transportation's CASI reports. For cities and other years, crashes by type are imputed based on population and road mileage ratios.

- $CPAA_j$ Data on Cost of Crashes from National Safety Council 2010.

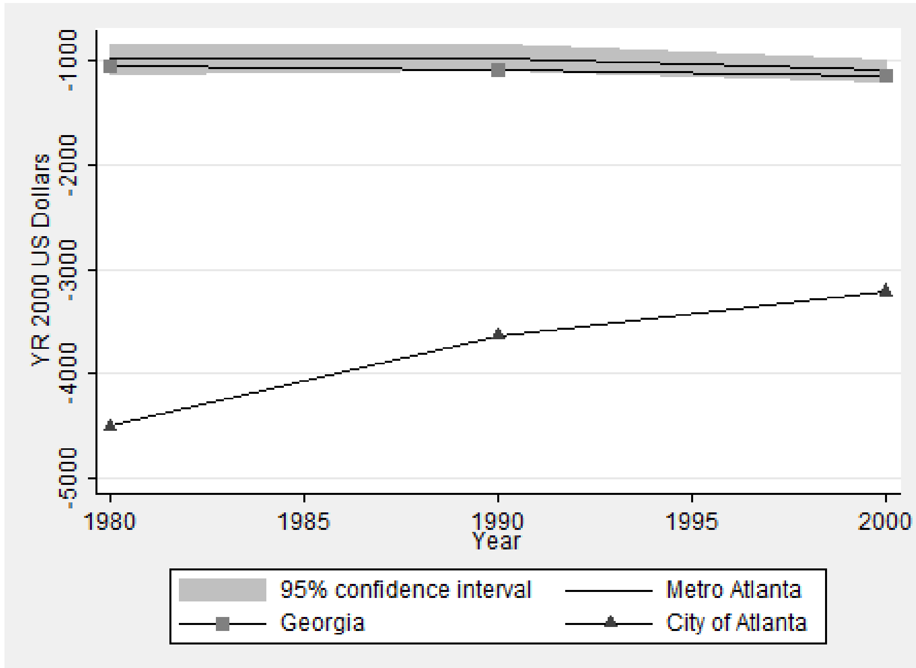

Figure 30: Per capita cost of auto accidents (O), selected geographies

5.2.3 Environment

5.2.3.1 N: Cost of household pollution abatement

The measure for cost of household pollution abatement is meant to capture the defensive costs by households to avoid or compensate for pollution. Three areas are chosen for inclusion: personal vehicles, wastewater, and solid waste.

$$CVPA_{i,t} = NNVR_{i,t} \times \$108.50 \tag{14}$$

$$CWW_{i,t} = p_{i,t}\left(\sum_{t+5}^{k=t} PEWW_{i,k}/p_{i,k}\right) \tag{15}$$

$$CSW_{i,t} = CPSWD_i \times p_{i,t} \times PSW_i \tag{16}$$

$$N = CHPA_{i,t} = CVPA_{i,t} + CWW_{i,t} + CSW_{i,t} \tag{17}$$

where:

$CVPA_{i,t}$	Cost of vehicle pollution abatement in place i at time t
$NNVR_{i,t}$	Number of new vehicle registrations in place i at time t
$CWW_{i,t}$	Cost of wastewater (sewers and septic tanks) in place i at time t
$PEWW_{i,t}$	Public expenditure on water and wastewater in place i at time t
$CSW_{i,t}$	Cost of solid waste at time in place i at time t
$CPSWD_i$	Cost per pound of solid waste disposal in place i
PSW_i	Pounds of solid waste generated per person in place i
$p_{i,t}$	Population in place i at time t
$CHPA_{i,t}$	Cost of household pollution abatement in place i at time t

- $NNVR_{i,t}$ The number of new vehicle registrations is calculated by the difference in the number of registrations from the previous year. Oddly, 1980 saw fewer registrations than 1979, so the 'cost' of vehicle pollution abatement is not calculated in 1980.

- $PEWW_{i,t}$ Data on public expenditure on water and wastewater are not separated in a meaningful way. The costs used are those for current operating expenditures on water (water treatment and distribution) and wastewater (collection and treatment). Local government expenditures on water and sewer current operations are from block 550 of the Department of Community Affairs local government finances survey. Because not every government responds each year, an average for five years of expenditure are used: 1990-1994 and 2000-2004 for 1990 and 2000, respectively. Data were not available for 1980, so 1990 expenditures per capita are used in 1980. Even after averaging, some governments do not have data on public water and wastewater data because it is not a service they provide; in such cases, an average of per capita costs from other city governments in the same county are used. Exceptions are Conyers in Rockdale County and Douglasville in Douglas County; both city governments work jointly with the County for water and wastewater services, so the per capita values for the County are used for the cities.

  This method differs from Costanza et al. (2004) because it does not attempt to approximate the direct cost to households by their use of sewer or septic services. However, municipal water and wastewater departments tend to operate near cost (sometimes at a loss), meaning that the cost to households should not be significantly different from the cost of water and wastewater operations (Environmental Finance Center, 2010). This method may underestimate the cost of abating household water pollution because the cost of septic systems is not separately addressed; counties and cities with a high percentage of housing units that are not connected to public sewer may have average costs that are not represented by the average sewer costs. Rate surveys in the latter half of the 2000 decade suggest average monthly sewer bills for households in Georgia to be around \$25 (for 6000 gallons) (Environmental Finance Center, 2010).

- $CPSWD_i$ **&**PSW_i Generation and cost of solid waste data from:Georgia Department of Community Affairs (2001). This report calculates 6.3 pounds per day per person of solid waste generated in state; Georgia also accepts solid waste from neighboring states. In addition, the cost per ton for solid waste disposal is estimated at \$38.50 which is far lower than the estimate of \$100 per ton nationwide in Franklin Associates (1997).

- $p_{i,t}$ Population data from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990; U.S. Census 2000

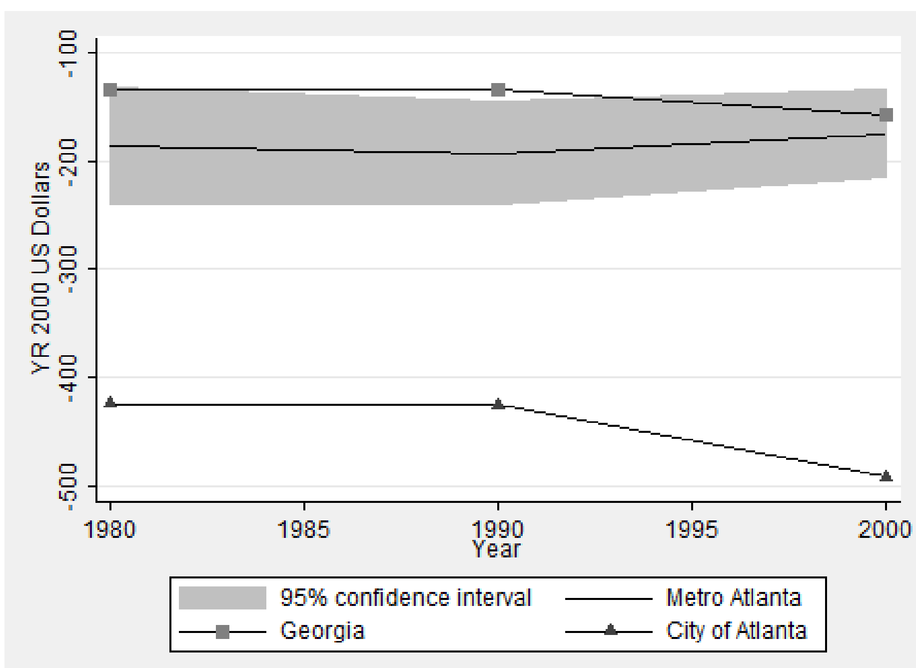

Figure 31: Per capita cost of household pollution abatement (N), selected geographies

Table 18: Value of Clean water in the United States(YR2000 USD per person)(Freeman, 1982, p.170, Table 9.1)

Benefit Area	Range	Most Likely Point
Recreation	\$ 21.35 to \$ 103.19	\$ 54.56
Nonuser benefits	\$ 5.93 to \$ 47.44	\$ 14.23
Commercial fishing	\$ 4.74 to \$ 14.23	\$ 9.49
Drinking water	\$ 0.00 to \$ 23.72	\$ 11.86
Municipal treatment	\$ 7.12 to \$ 14.23	\$ 10.67
Households	\$ 1.19 to \$ 5.93	\$ 3.56
Industrial supplies	\$ 4.74 to \$ 9.49	\$ 7.12
Total	\$ 45.07 to \$ 218.24	\$ 111.49

5.2.3.2 *P: Cost of water pollution*

Georgia has 11,813 lakes, ponds and reservoirs, contributing 425,582 acres of open water. In addition, 44,056 miles of perennial streams and rivers and 23,906 miles of intermittent streams provide water resources. Valuing the cost of water pollution is difficult; first, the value of water if it were clean must be determined, and then the cost is determined based on the loss of use from pollution. Determining the value of clean water is an imputation based on the methods used in Talberth et al. (2007). If all the water in Georgia were pristine, the value of water would be \$692.2 million YR2000 USD. Unfortunately, water quality testing in 2000 and 2001 found thirty-nine percent of waters to either partially support or not support designated uses. While a large portion of causes of waters not supporting designated uses is due to mercury or otherwise contaminated large fish, bacteria, temperature, and other impairments prevent the use of waters in Georgia (Georgia Environmental Protection Division, 2002).

$$P = CWP_{i,t} = (PCVCW \times (1 - PSWDU_{i,t})) \times p_{i,t} \tag{18}$$

where:

$CWP_{i,t}$	Cost of water pollution in place i at time t
$PCVCW$	Per capita value of clean water
$PSWDU_{i,t}$	Percent of waters tested supporting their designated use in place i at time t
$p_{i,t}$	Population in place i at time t

- $CAP_{n,t}$Per capita value of clean water is \$84.59 YR2000 USD derived from Freeman (1982) and Talberth et al. (2007).

- $PSWDU_{i,t}$ Calculated from percent of waters (average) by county supporting designated uses. Detailed tabular water quality data acquired via personal communication with Susan Salter of the Georgia Department of Natural Resources. Water quality data for 2000 and 2001 match that in the Appendix of the report Georgia Environmental Protection Division (2002). However, not all waters are tested for quality; data for 2000 and 2001 cover 93% of Georgia lakes but only 26% of perennial streams and rivers. In addition, while extent of the impaired water bodies, in miles or acres, is reported for those sites that are tested, the extent is not reported for untested waters. All waters in Georgia have a designated use; for all streams and rivers, unless otherwise stated, fishing is a designated use (**?**). In addition, Georgia designates drinking water, recreation, coastal fishing, and wild and scenic rivers. Water by county is listed by designated use; unfortunately, this water data does not include extent. These data limitations prevent the imputation of percent of water impaired by designated use or by county with any confidence becuase the percent of water tested by designated use and county is not avaialable.

- $p_{i,t}$ Population data from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990; U.S. Census 2000

5.2.3.3 Q: Cost of air pollution

Air pollution is famous for decreasing visibility, but it can also cause or aggravate health problems. The Clean Air Act amendments of 1990According to Freeman (1982), the benefits of avoiding air pollution led to a benefit of $276 YR2000 USD per person in 1978. The value of benefits is based on studies of health (morbidity and mortality), soiling, vegetation, materials, and property value benefits of air pollution avoidance policies (see Table 19.

In this study, the cost of air pollution is weighted from national costs in the year 2000 and then adjusted by an index of the average yearly PSI for 1990 and 1980. For example, if the air quality of a place was better in 1990 than in 2000, the cost would be lower in 1990. Unfortunately, air quality data are not available for many distinct places in Georgia, and air pollution tends to vary locally.

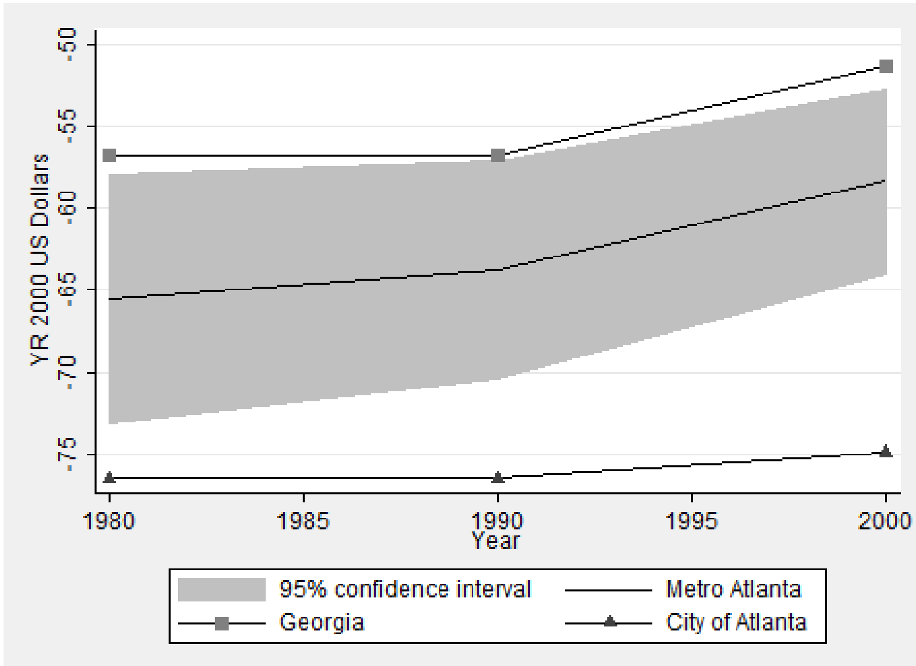

Figure 32: Per capita cost of water pollution (P), selected geographies

Table 19: Value of Clean Air in the United States(YR2000 USD per person)(Freeman, 1982, p.128, Table 7.1)

Benefit Area	Range	Most Likely Point
Health	$ 36.77 to $ 481.54	$ 201.63
Soiling & Cleaning	$ 11.86 to $ 71.16	$ 35.58
Vegetation	$ 1.19 to $ 4.74	$ 3.56
Materials	$ 4.74 to $ 16.60	$ 8.30
Property Values	$ 10.67 to $ 105.56	$ 27.28
Total	$ 65.23 to $ 672.50	$ 276.35

This means that a monitor within one city or county is capturing the air quality for that point, but may not reflect on the average air quality in the city or county. Rural places tend not to have air quality monitors unless they have large factories or fossil fuel power plants to attract the attention of limited air quality dollars. The lack of monitoring is not an indication that the air quality in a place is pristine. In addition, an average air quality for the state is hardly represented by the average of air quality data reported across the state. Because of these limitations, the cost of air pollution based on monitored air quality data is given as a best estimate but with reservation.

$$Q = CAP_{i,t=2000} = p_{i,t=2000} \times \frac{CAP_{n,t=2000}}{p_{n,t=2000}} \tag{19}$$

$$Q = CAP_{i,t} = \frac{PSII_{i,t}}{PSII_{i,t=2000}} \times CAP_{i,t=2000} \tag{20}$$

where:

$CAP_{i,t}$ Cost of air pollution in place *i* at time *t*

$p_{i,t}$ Population in place *i* at time *t*

$PSII_{i,t}$ Index of average yearly PSI in place *i* at time *t* with PSI index for 2000 set to equal 100

- $CAP_{n,t}$ The cost of air pollution at the national level is from Talberth et al. (2007).
- $PSII_{i,t}$ PSI values were acquired from U.S. Environmental Protection Agency.
- $p_{i,t}$ Population data from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990; U.S. Census 2000

5.2.3.4 R: Cost of noise pollution

Estimates for the damage caused in the U.S. by noise pollution in 1972 was $4 billion ($14.6 billion YR2000 dollars) (Congressional Quarterly, Inc. 1972, 980). GPI associates noise pollution with urbanization, assuming that the urban population is the key factor in determining noise affecting a population. Noise pollution is assumed to improve by one percent each year. A better measure might use the distance to airports or highways to differentiate noise and urbanization.

$$R = CNP_{i,t} = \frac{up_{i,t}}{up_{n,t}} \times CNP_{n,t} \tag{21}$$

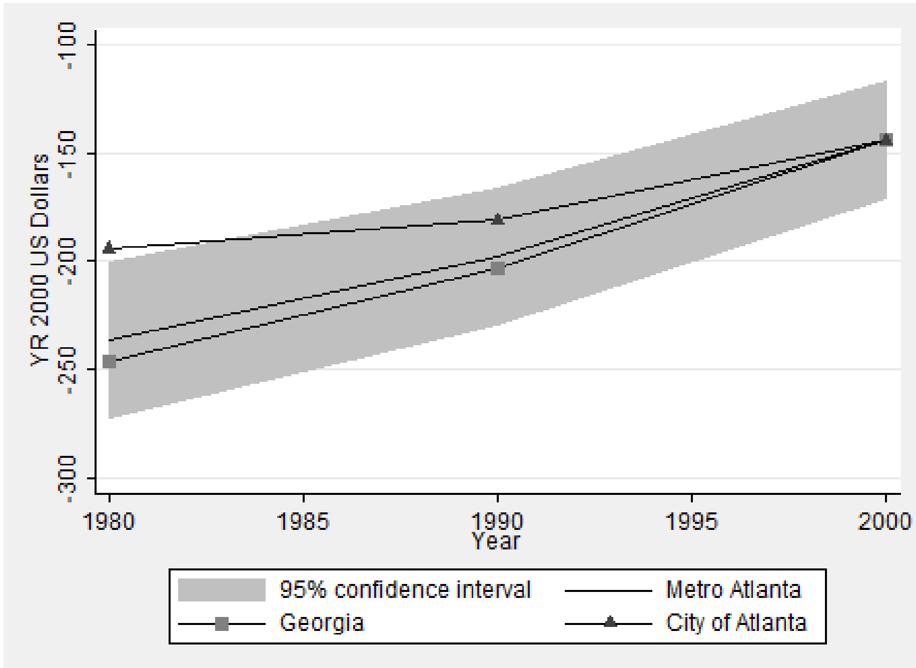

Figure 33: Per capita cost of air pollution (Q), selected geographies

where:

$CNP_{i,t}$	Cost of noise pollution in place *i* at time *t*
$up_{i,t}$	urban population in place *i* at time *t*
$CNP_{n,t}$	Cost of noise pollution, nationally, at time *t*

- $up_{i,t}$ Urban and rural population figures are available from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990, STF3, P006; U.S. Census 2000, SF3, P5
- $CNP_{n,t}$ Cost of noise pollution is scaled from the value of $14.6 Billion USD based on an improvement of one percent per year

5.2.3.5 V: Cost of long-term environmental damage

The cost of long-term environmental damage estimates a cost of $2.56 per barrel of oil equivalent for all non-renewable and hydroelectric energy resources used because of the ecological damage and potential climate change (Talberth et al., 2007).

$$V = CLTED_{i,t} = \$2.56 \times TNRE_{i,t} + HYTCB_{i,t} \times \frac{BOE}{1.8 \times 10^{-7} BTU} \tag{22}$$

where:

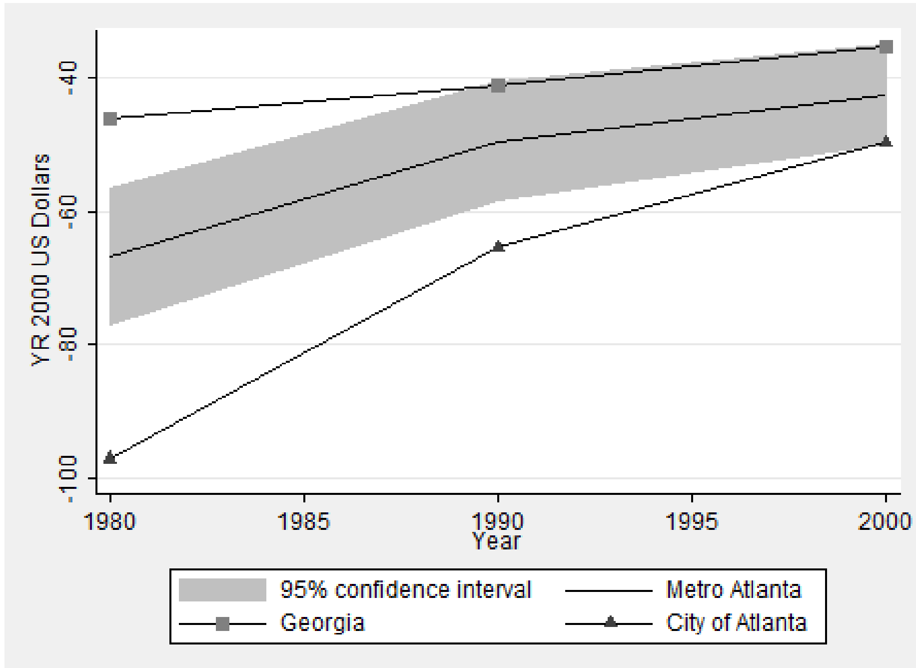

Figure 34: Per capita cost of noise pollution (R), selected geographies

$CLTED_{i,t}$	Cost of long-term environmental damage in place i at time t
$TNRE_{i,t}$	Total non-renewable energy consumption in place i at time t
$HYTCB_{i,t}$	Hydroelectric energy production in place i at time t

- $TNRE_{i,t}$ **&** $HYTCB_{i,t}$ From the EIA. See Section 5.2.4.8.

5.2.4 Resources

Resources needs to be further broken down in order to ensure a conceptual difference between man-made and natural capital.

Man-made capital

5.2.4.1 G: Value of service from streets & highways

The value of streets and highways is based on the national ratio of value of stock of streets and highways to the mileage of the same. This ratio is then applied to the mileage of streets and highways at each local jurisdiction, i.

$$G = VSH_{i,t} = FS \times \frac{VSH_{n,t}}{MSH_{n,t}} \times MSH_{i,t} \tag{23}$$

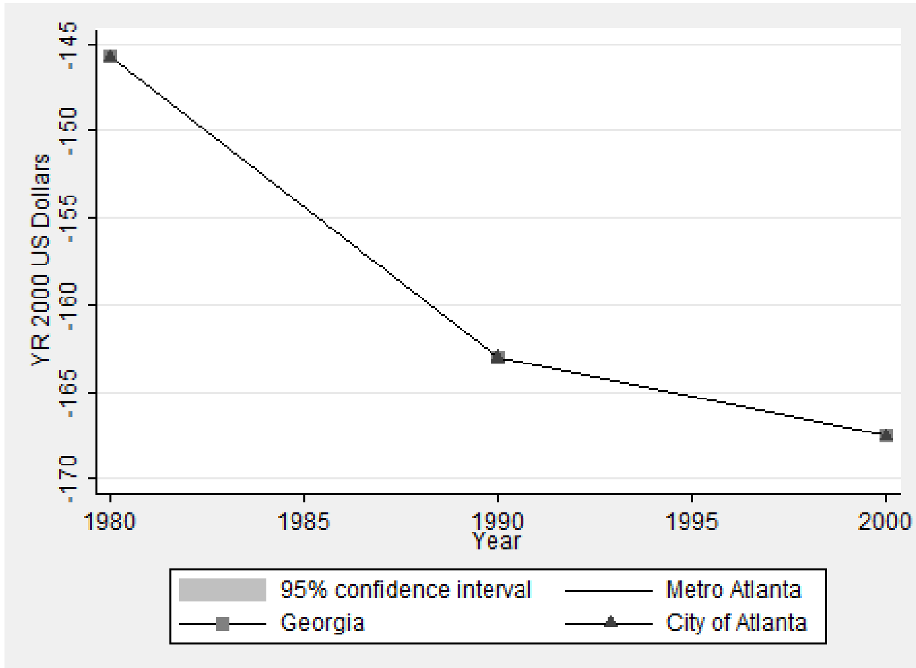

Figure 35: Per capita cost of long-term environmental damage (V)), selected geographies

where:

$VSH_{i,t}$	Value of stock of streets and highways in place i at time t
$MSH_{i,t}$	Miles of streets and highways in place i at time t
FS	Constant value for the services from the use of streets and highways, 7.5%
n	nation

- $VSH_{n,t}$ The national stock of streets and highways is from Gross Fixed Assets in Highways and Streets from BEA (2009) NIPA Table 5.8.5A. Gross Government Fixed Investment by Type

- $MSH_{n,t}$ US road mileage from Bureau of Transportation Statistics (2002); 43,000 miles were added to reported mileage in year 2000 because the notes suggest it is missing: "All public road and street mileage in the 50 states and the District of Columbia. For years prior to 1980, some miles of nonpublic roadways are included. No consistent data on private road mileage are available. Beginning in 1998, approximately 43,000 miles of Bureau of Land Management Roads are excluded.".

- $MSH_{i,t}$ Georgia road mileage data from GA DOT 441 Reports (Georgia Department of Transportation, 1980, 1989, 2000). Because year 1990 data were incomplete, I used data from 1989 for the 1990 values.

- FS Constant value of the flow of services from streets and highways is based on 75% of a 10% depreciation of value from Talberth et al. (2007).

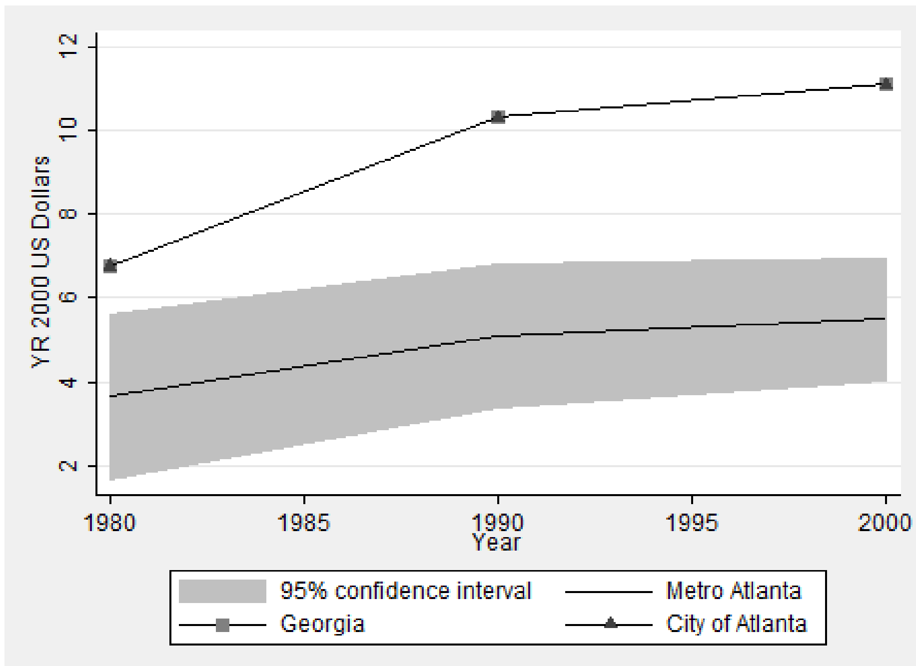

Figure 36: Per capita value of service from streets & highways (G), selected geographies

5.2.4.2 F: Value of service from consumer durables

Because the cost of consumer durables is counted as a cost (subtracted from expenditures), the value of the services, or use, from durables should be added back in as a positive value because our welfare is improved by the services provided by consumer durables.

$$F = SCD_{i,t} = DR \times \frac{API_{i,t}}{API_{n,t}} \times NCD_{n,t} \tag{24}$$

where:

$SCD_{i,t}$	Service from consumer durables in place *i* at time *t*
DR	A constant depreciation rate of 12.5%
$API_{i,t}$	Aggregate personal income in place *i* at time *t*
$NCD_{n,t}$	Net national stock of consumer durables at time *t*

- DR Constant depreciation rate from Talberth et al. (2007)
- $API_{i,t}$ Aggregate personal income is based on the population and per capita income from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990, STF3, P114A; U.S. Census 2000, SF3, P82
- $NCD_{n,t}$ Net stock of consumer durables only found at the national level; (source: BEA Table 1.1 from http://www.bea.gov/national/FA2004/SelectTable.asp)

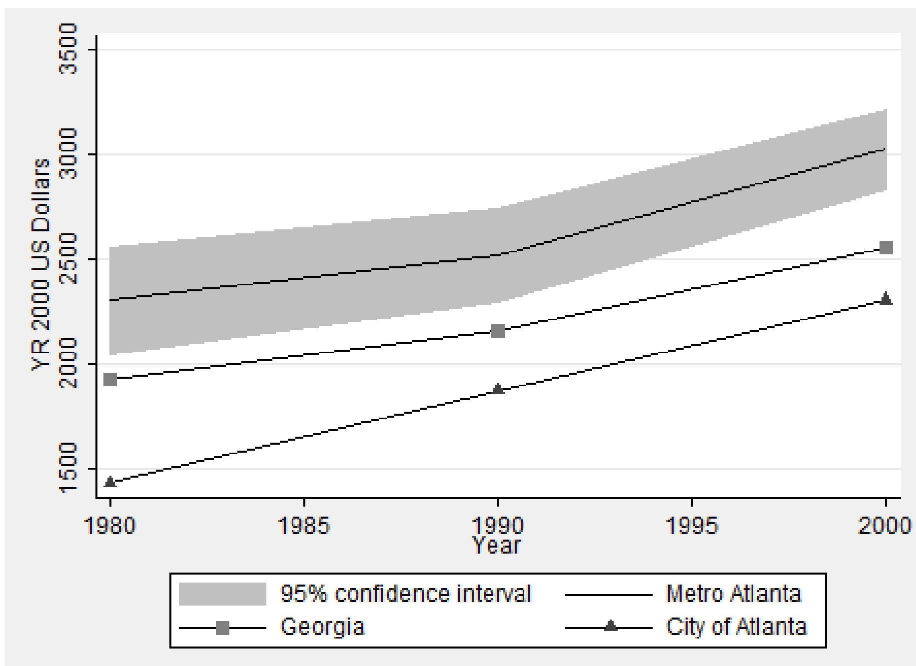

Figure 37: Per capita value of service from consumer durables (F), selected geographies

5.2.4.3 L: Cost of consumer durables

The cost of consumer durables in any given year is based on a ratio of expenditures on consumer durables to income. This value is subtracted from the total consumption value because durables expense is taken in one year while the services, or enjoyment, of the durables are not completely consumed in the same year. Services from the stock of durables is added back into the GPI as term F (see Section 5.2.4.2). The portion of expense is based on the national average of consumption to income and then the Atlanta average portion of consumption that is for durable goods. If the difference in the rate of savings among the local population and the national population is significant, this measure becomes a less effective estimate.

$$L = CCD_{i,t} = PC_{i,t} \times PCD_{a,t} \tag{25}$$

where:

$PC_{i,t}$ Personal consumption in place i at time t

$PCD_{a,t}$ Portion of expenditure on consumer durables in Atlanta at time t

- $PC_{i,t}$ National expenditure is from the National Income and Product Accounts Table 2.1. Personal Income and Its Disposition; U.S. Department of Commerce, Bureau of Economic Analysis.

- $PCD_{a,t}$ Atlanta (from NIPA 86/87, 90/91, 00/01) For full reference, see NIPA Tables.xlsx

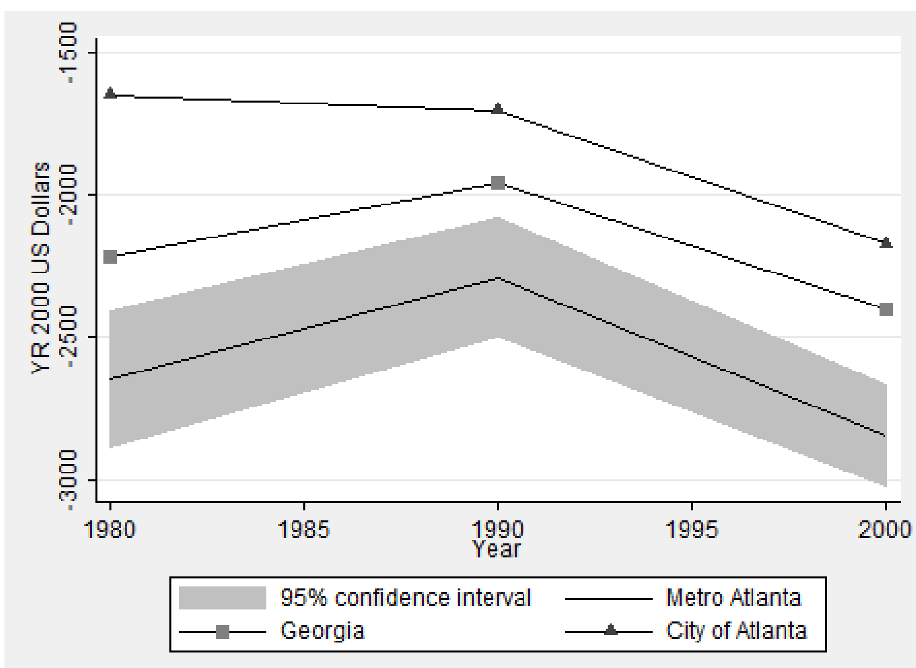

Figure 38: Per capita cost of consumer durables (L), selected geographies

5.2.4.4 *Y: Net capital investment*

The net capital investment measure takes the lesson of capital to labor put forth by Nordhaus and Tobin (1973) to heart. New capital investment above that required to maintain the same capital to labor ratio of the previous time is used as a measure of improvement. This value is population scaled from national data because data on net stocks are not available at lower levels (Talberth et al., 2007).

$$Y = NCI_{i,t} = CI_{i,t} - \left(\frac{CI_{i,t-1}}{NW_{i,t-1}}\right) \times NW_{i,t} \tag{26}$$

where:

$NCI_{i,t}$ Net capital investment in place i at time t

$CI_{i,t}$ Capital investment in place i at time t

$NW_{i,t}$ Number of workers in place i at time t

- $CI_{i,t}$ Capital investment is estimated based on the national stock of nonresidential capital at the end of the year. Unfortunately, more localized data could not be identified, and this number is population weighted to local areas. As such, areas with more or less investment than the national average will not be properly represented by this estimate.

- $NW_{i,t}$ The number of workers is from data tables on sex by employment status: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990, STF3, P070; U.S. Census 2000, SF3, P43

Natural capital

5.2.4.5 *S: Cost of loss of wetlands*

Cost of loss of wetlands depends on the wetlands lost to development in Talberth et al. (2007). However, the amount of wetlands lost to development as opposed to loss to other uses or gained is not clear from data. Thus, all wetlands lost since 1974 (the earliest year for which data by County is available) are considered here.

$$S = CLOW_{i,t} = VWL \times (WL_{i,t=1974} - WL_{i,t}) \tag{27}$$

where:

VWL Value of wetlands per acre

$WL_{i,t}$ Acres of wetlands in place i at time t

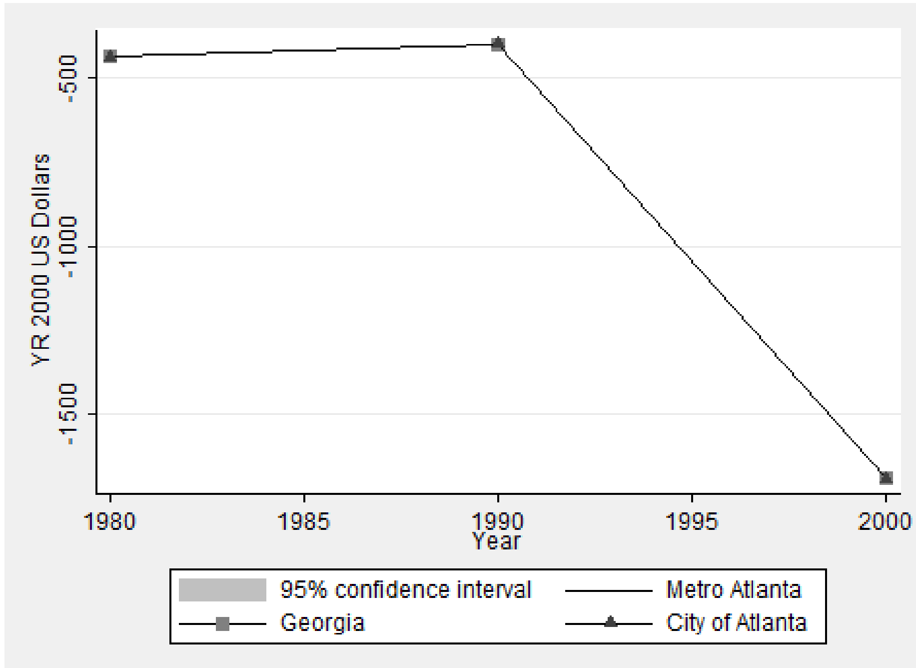

Figure 39: Per capita net capital investment (Y), selected geographies

- VWL The value of wetlands is estimated at $6781 YR2000 USD per acre.
- $WL_{i,t}$ Wetlands in acres is from the Georgia Land Use Trends database maintained by University of Georgia's Natural Resources Spatial Analysis Laboratory (NARSAL).

5.2.4.6 T: Cost of loss of farmlands

For many counties in Georgia, land used for farming increased between 1990 and 2000. This method improves upon earlier models by using the value per acre by farm in each county for the value of farm land lost or gained in that county.

$$T = CLOFm_{i,t} = VFm_{i,t} \times (FmL_{i,t-1} - FmL_{i,t}) \tag{28}$$

where:

$CLOFm_{i,t}$	Cost of the loss of farm land in place i at time t
VFm	Value of farm land per acre in place i at time t
$FmL_{i,t}$	Acres of farm land in place i at time t

- VFm **&** $FmL_{i,t}$ The value and extent of farm land is from the Georgia Census of Agriculture. Data are available for 1987, 1992, 1997, and 2002; 1987 data are used for 1980 estimates

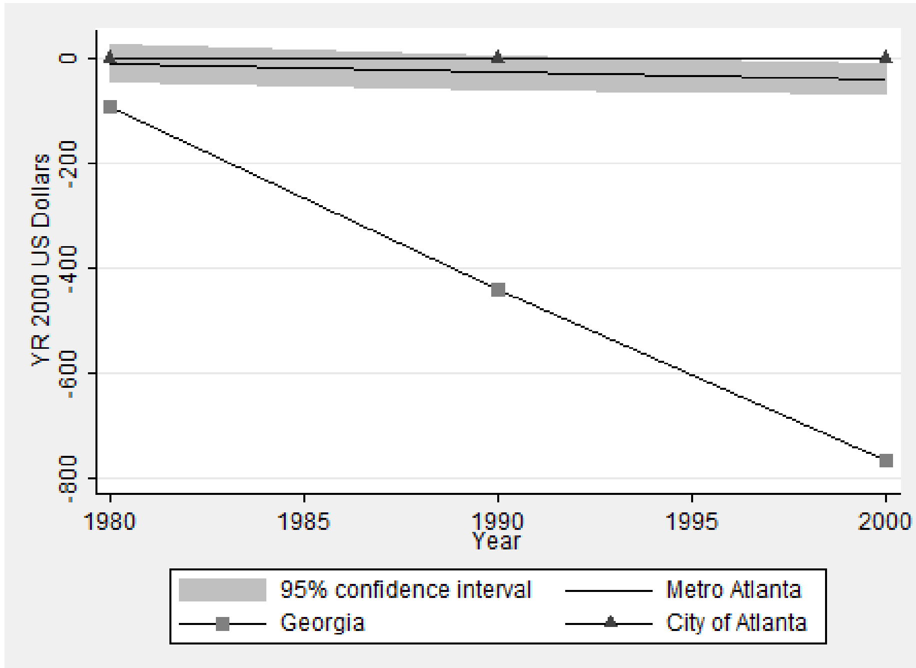

Figure 40: Per capita cost of wetland loss (S), selected geographies

while averages of 1987 &1992 and 1997 & 2002 are used for 1990 and 2000 estimates, respectively. Value is based on sales of products produced on the land while extent is the total acres of farmland for any year. Data are not available for cities.

5.2.4.7 X: Cost of loss of forest land

"Conversion of forest land to urban use is the greatest threat to the sustainability of Georgia's water quantity and quality" (Commission, 2010, p.45). Cost of loss of forest land depends on the forest land lost to development in Talberth et al. (2007). However, the amount of forest land lost to development as opposed to loss to other uses or gained is not clear from data. Thus, all forest land lost since 1974 (the earliest year for which data by county is available) are considered here.

$$X = CLOF_{i,t} = VFL \times (FL_{i,t=1974} - FL_{i,t}) \tag{29}$$

where:

VFL Value of forest land per acre

$FL_{i,t}$ Acres of forest land in place i at time t

- VFL The value of forest lands is estimated at \$481 YR2000 USD per acre (Costanza et al., 2004).

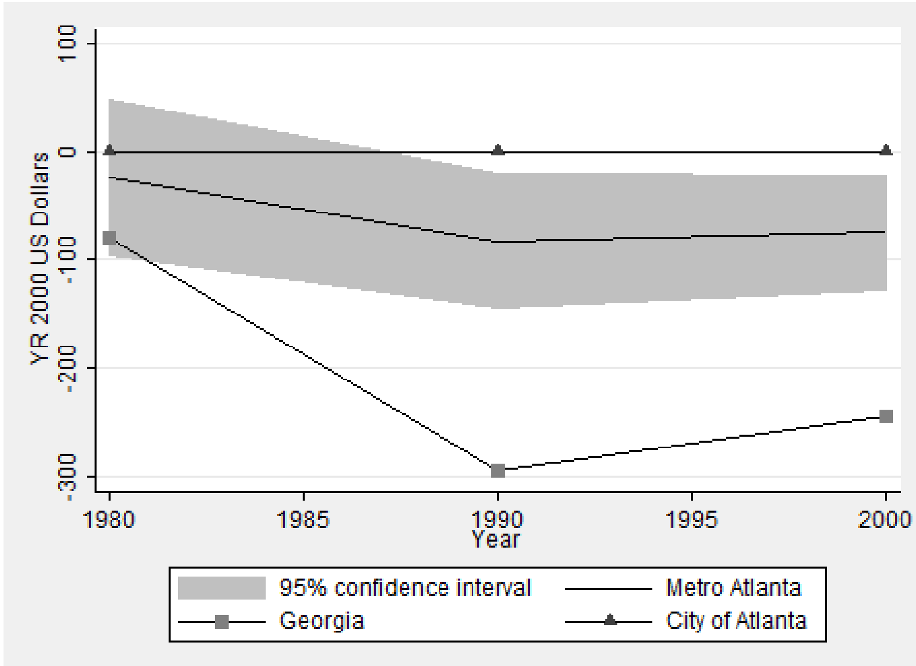

Figure 41: Per capita cost of farm land loss (T), selected geographies

- $FL_{i,t}$ Forest land in acres is from the Georgia Land Use Trends database maintained by University of Georgia's Natural Resources Spatial Analysis Laboratory (NARSAL).

5.2.4.8 U: Cost of depletion of non-renewable resources

Cost of depletion of non-renewable resources considers the potential cost to replace non-renewable energy consumption with a renewable form. The GPI methodology suggest using the cost of ethanol at \$109.71 per barrel as a proxy for a potential suite of options with costs that are largely unknown (Talberth et al., 2007).

$$U = CDNR_{i,t} = TNRE_{i,t} \times \frac{\$109.71}{barrel} \times \frac{BOE}{1.8 \times 10^{-7} BTU} \tag{30}$$

where:

$CDNR_{i,t}$ Cost of depletion of non-renewable resources in place i at time t

$TNRE_{i,t}$ Total non-renewable energy consumption in place i at time t

- $TNRE_{i,t}$ Energy consumption data at the state level is available from the Energy Information Administration. Data for counties and cities is, unfortunately, population weighted.

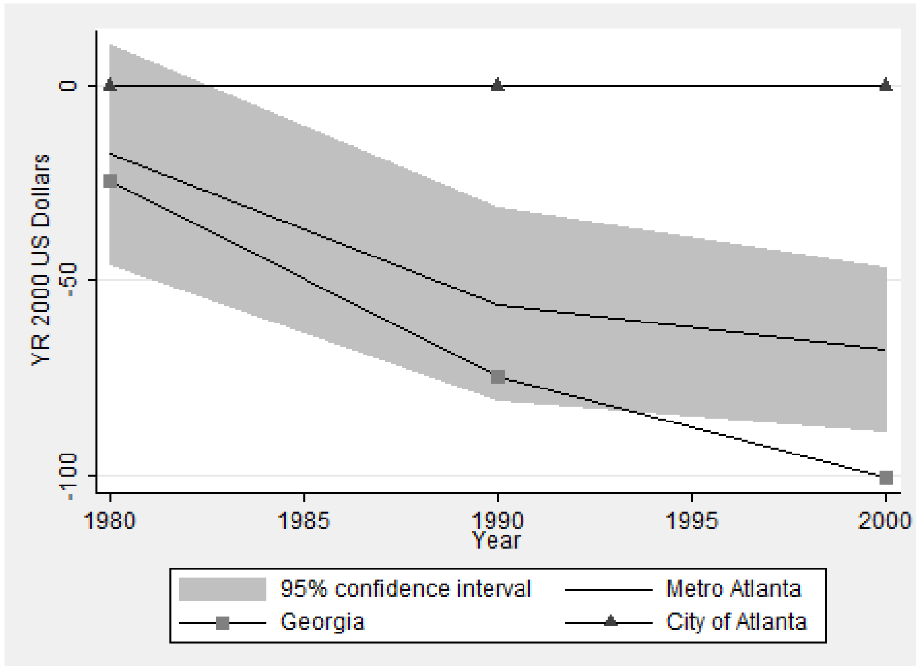

Figure 42: Per capita cost of forest land loss (X), selected geographies

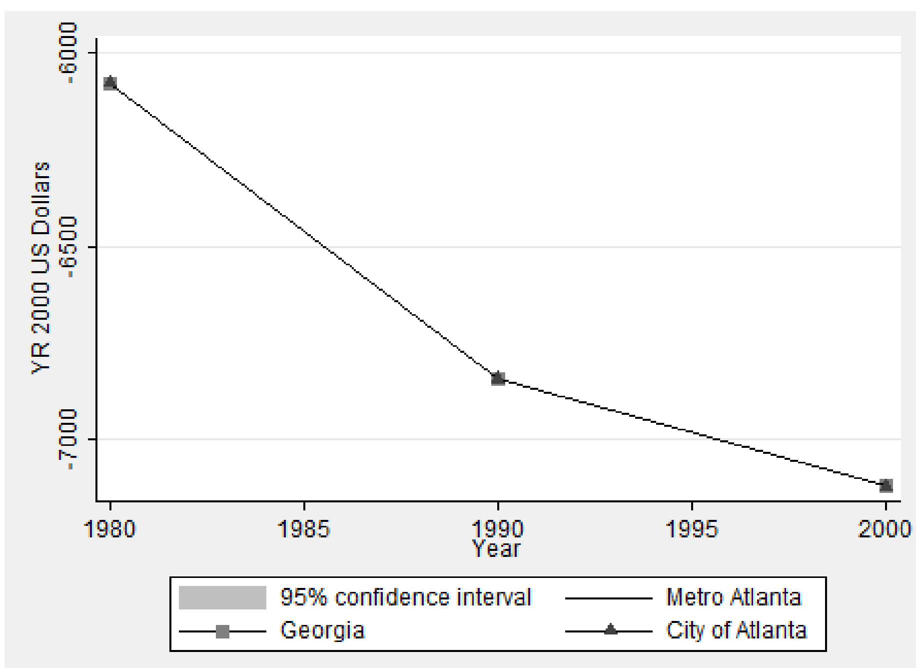

Figure 43: Per capita cost of depletion of non-renewable resources (U), selected geographies

5.2.4.9 W: Cost of ozone depletion

5.2.4.10 Description

The cost of ozone pollution assumes that each person has a responsibility for ozone emissions from global production of chlorofluorocarbons.

5.2.4.11 Calculation

$$W = COD_{i,t} = \frac{\$49669 \times GP_t}{p_{n,t}} \times p_{i,t} \tag{31}$$

where:

$COD_{i,t}$	Cost of ozone depletion in place i at time t
GP_t	Global production of chlorofluorocarbons at time t
$p_{i,t}$	Population in place i at time t

5.2.4.12 Data source

- GP_t Data on the emissions of the ozone-depleting chemicals CFC-11, 12, 113, 114, and 115 are available from the Alternative Fluorocarbons Environmental Acceptability Study (AFEAS)
- $p_{i,t}$ Population data from: U.S. Census 1980, Missouri Census Data Center stf803x2; U.S. Census 1990; U.S. Census 2000

5.2.5 Overall GPI

The overall GPI is the sum of all of the individual measures, C through Y. This value can be used in direct comparison with GDP values for a place. However, welfare is an individual measure, so the GPI is most logically divided by the population at all levels and reported as GPI per capita.

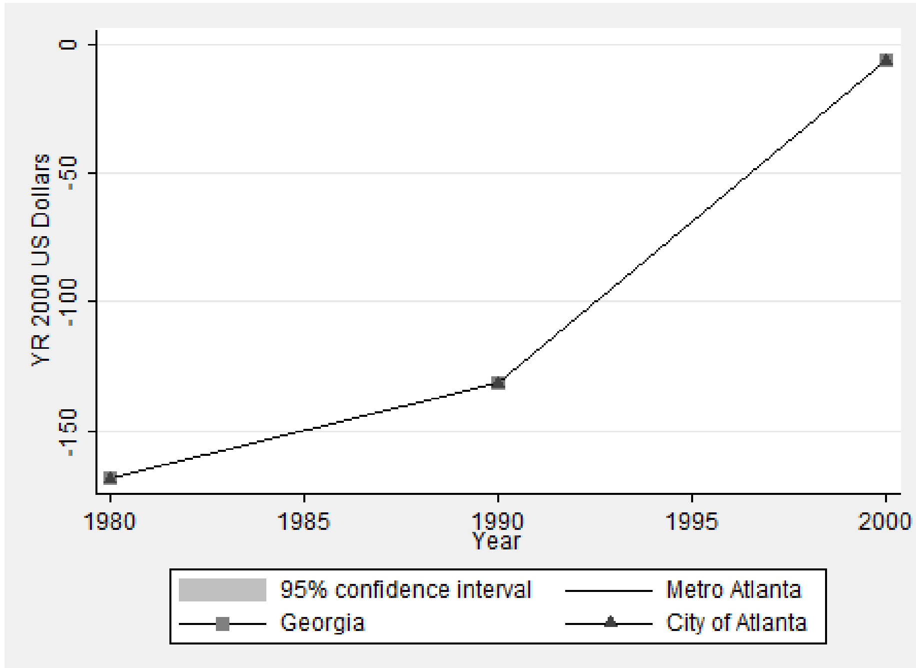

Figure 44: Per capita cost of ozone depletion (W), selected geographies

5.3 Measuring HDI

Due to data limitations, the HDI is calculated for counties and not for cities. Agostini and Richardson (1997) calculated HDI for several cities across the United States, but they focused on large cities, such as Atlanta; their method also required deduction from the state and metropolitan level, making it less applicable to within metropolitan applications. The basic method employed here is from the United Nations technical documentation for calculating the HDI (United Nations, 1990, 2008). However, indices produced in the present method are based on the range of minimum and maximum among only the counties studied rather than the minimum and maximum values used on the international scale.

5.3.1 Education

Education is measured here by adult basic prose literacy. This measure identifies the lowest levels of education that allow citizens to participate in society. Literacy data by county is available from U.S. Department of Education (1992, 2003), and the 1992 levels are extended to 1980.

5.3.2 Health

Longevity is a reflection of health in a place; here, it is measured based on life expectancy at birth. Life expectancy by birth for counties was retrieved from supplementary online tables as part of Murray et al. (2006). Additional health measures, such as infant mortality could be helpful for distinguishing metropolitan regions from each other, but within metropolitan regions, such measures make less sense.

5.3.3 Purchasing Power

Adjusted income for a place and time for this study is $AI_{i,t} = PCI_{i,t} \times (1 - GC)$ where I is income and GC is the Gini coefficient. Details on the method and data source for deriving the Gini coefficient can be found in Section 5.2.1.2. Also, this is the same method used to deflate consumption for the GPI, see Section 5.2.1.3. Hicks (1997) specifically called for adjustment of the HDI measures to account for income inequality, and Agostini and Richardson (1997) used the present method in their calculation of the inequality adjusted income for cities.

5.3.4 Overall HDI

The HDI value is then the average of the indexed values of each of the three dimensions: education, health, and purchasing power. In this dissertation, the range for the HDI and its subsidiary income, life expectancy, and literacy indices is based on the minimum and maximum values for the counties in the metropolitan region. This is done because using the international ranges provided by the United Nations (2008, Technical Note 1) results in a clumping of indexed results at the top of the range; a similar problem was encountered by Agostini and Richardson (1997). Minimum and maximum values, along with the 28 county metropolitan results are shown in Table 20. These ranges are helpful when thinking about how these counties and the Atlanta metropolitan region stack up against other places; for example, the literacy range is just 13 percentage points, and even the poorest performing county has an adult basic prose literacy rate of 78.7%. The ranges for life expectancy are even narrower. As such, a low performance on this scale suggests relative low performance and not a pervasive literacy or health problem. Adjusted per capita income has a much larger scale, where the maximum value is nearly three times the minimum value.

Table 20: Minima and Maxima for HDI calculations

	Metro	Min	Max
		Literacy	
1980	80.6	63.4	93.3
		Lamar	Gwinnett
1990	80.6	63.4	93.3
		Lamar	Gwinnett
2000	85.6	78.7	91.8
		Carroll	Forsyth
		Life Expectancy	
1980	72.9	70.1	75.3
		Meriwether	Gwinnett
1990	74.3	71.3	78.4
		Fulton	Fayette
2000	75.4	73.3	78.9
		Haralson	Fayette
		Adjusted Per Capita Income ($ 1000)	
1980	26.8	17.6	44.5
		Meriwether	Fayette
1990	24.7	15.8	45.3
		Meriwether	Fayette
2000	26.8	17.6	44.5
		Haralson	Fayette

5.4 Comprehensive Plans

Comprehensive plans were obtained from the Georgia Institute of Technology library, the Department of Community Affairs, regional development commissions, and local governments themselves.

5.4.1 Evaluating Plan Policies

Plan policies are evaluated through content analysis. Krippendorff (2004) brings up six questions to be addressed in every content analysis. These questions and answers for this dissertation research are presented below:

1. **Which data are analyzed?** The policy statements of local comprehensive plans are analyzed.

2. **How are they defined?** The first step in evaluating plan policies is to define what is meant by a plan policy statement. A plan policy statement is either included in a section of the plan called "policies" or some synonym, or found within the Short Term Work Plan (STWP).

Coding statements that did not claim to be policy statements on the criteria for policy statements could lead to a bias towards lower scores. For example, goal statements would appear to be similar to policy statements, but would likely not include the level of detail necessary for action required of policy statements.

3. **What is the population from which they are drawn?** All policy statements within an identified plan are included for that plan; the population of plans is all local comprehensive plans published within the 28 county Atlanta-Sandy Springs-Marietta, Georgia MSA from 1989 to 2010.

4. **What is the context relative to which the data are analyzed?** The context is the quality of policy statements and their commitment to sustainable development based on previous studies.

5. **What are the boundaries of the analysis?** The boundaries are geographic limits described in the population above.

6. **What is the target of the inferences?** The inferences from the content analysis will be used to inform understanding on plan relationship to sustainable development. Inferences will also be used to relate plan quality and commitment to sustainable development.

5.4.2 Coding logistics

All plans were coded using the Coding Analysis Toolkit program. Coding Analysis Toolkit is an open source text coding software which allows online collaboration. Policy statements were extracted from plans that were acquired during the data collection period. Each extracted policy statement is coded individually. Two coders were used to improve assessment validity. Intercoder agreement, meaning, "the extent to which the different judges tend to assign exactly the same rating to each object" will be calculated (Tinsley and Weiss, 2000, p.98). For intercoder agreement, the κ statistic is calculated using the *kap* function in STATA 10. Kappa κ represents the reliability of coding based on the disagreements between coders, where $\kappa = 0$ represents agreement entirely by chance and $\kappa = 1$ represents perfect agreement. Coding was completed in phases; both coders completed the first 40 statements, compared results and modified the coding guide to ensure consistent application of the coding. This was repeated three times before both coders were confident of meanings; then, all statements were coded using agreed upon method.

5.4.3 Coding specifics

Each plan policy statement was coded by issue area and principle of sustainable development for grouping purposes. Plans were sorted by issue area, so issue area is the only code not determined by both coders. Categories for coding policy statements have been revised through test coding of actual plan policy statements. Proper category creation is important to measurement validity; categories must be "precise in meaning, unambiguous, complete (able to code all possible responses) and not overlap or duplicate one another" (Putt and Springer, 1989, p.245). In addition to assigning categories, each plan policy statement was scored for the quality of the policy statement; quality measures are based on true or false logic. A plan policy statement can receive a maximum score of 3 quality points based on the sum of three individual quality aspects. However, total policy statement scores have a range of 1 to 4 because a value of 1 is given to each statement to distinguish the presence of even a poor policy statement from no policy statement at all.

1. Policy statements are grouped into the issue areas (sorting only)

    - Housing
    - Economic Development
    - Land Use
    - Transportation
    - Water; specifically water and wastewater treatment and distribution
    - Energy
    - Community Facilities and Services (balance)
    - Natural Resources
    - Cultural and Historic Resources
    - NONE (some policy statements refer to the process of planning or are otherwise not quite a fit for the nine issue areas)

2. Policy statements are characterized by sustainable development principle (sorting only).

    - Harmony with nature
    - Livable built environments
    - Place based economies
    - Equity; and a link to global concerns
    - Polluters pay principle
    - Responsible regionalism
    - NONE (not all policies will be related to a sustainable development principle)

3. Is the policy statement worded in strong (such as: adopt or build) or weak language (such as: encourage or try)?

4. Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.

5. Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

5.4.4 Coding examples

Some example policy statements are listed here with their associated coding logic to demonstrate the coding method.

> Consider modifying the county's hotel/motel tax structure to help offset the high cost of public safety and school use that the county is reportedly incurring from extended-stay motels.

This policy, from Clayton County's 2004 Comprehensive plan would be assigned issue area Community Facilities and Services because it is dealing with the funding of community services from existing structures; if it were referring to new development of extended-stay motels, it would belong in Land Use because the policy could change whether or not land would be used for such motels. It is dealing with the sustainable development principle of Equity because the concern is for an equal burden of support for community services. The policy statement language is weak because the verb is “consider”; it is not clear because the method of consideration is not laid out (will there be a committee? a hearing? a cost-benefit analysis?); and it is not measurable because we can not look back and see if something was considered. The resulting score is 1.

> Reduce the amount of waste in the solid waste stream by encouraging voluntary recycling of aluminum, glass, newspaper, yard waste and other recyclable materials.

The above policy from Forsyth County’s 2004 Comprehensive plan would be assigned issue area Community Facilities and Services because it is addressing solid waste services provided by the county. It is addressing the sustainable development principle of harmony with nature because limiting waste and recycling reduce stresses on landfills and natural resources. The policy statement language is strong because the verb is “reduce”; the statement is not clear because the method of encouragement is left to be discovered; and it is measurable because we could track the volume or weight of solid waste over time. The resulting score is 3.

> Develop and implement a natural resources strategy to identify and preserve critical elements of Cobb’s environment. The strategy should include methods to protect critical green space areas in the county and should incorporate existing county ordinances, such as the tree preservation and replacement and the solid waste handling ordinances.

This policy, from Cobb County’s 1990 Comprehensive plan belongs in the Natural Resources issue area and the harmony with nature sustainable development principle categories. The language is strong because of the verbs, “develop” and “implement”; the action is specific - to create a plan including particular things; the statement is measurable because we could later see if a natural resource strategy was developed including those things. The resulting score is 4.

5.5 Sub-cases

While all jurisdictions in metropolitan Atlanta, as well as the region as a whole, are evaluated for sustainable development, only a subset were able to be evaluated for plan quality and commitment to sustainable development in plans. Further, only this subset could then be used to analyze the relationship between planning and development. In an ideal world, plans from all jurisdictions would be used. However, only plans that could be obtained and also included identifiable policy statements were included. When multiple plans were found for a particular jurisdiction, the plan closest to 1990 was used.

An unfortunate finding when searching for archived plans is that they are not well organized, centrally archived, easily retrieved, or freely available. Local governments who did not have their archived plans identified the regional commission as the document keepers; on the other hand regional commissions not finding documents cited local governments or the Department of Community Affairs as the document keepers.[2] This confusion led to a shortage of plan documents from the desired study period. According to the Official Code of Georgia 50-8-369a), the responsibility lies with the regional commissions: "the commission shall maintain all local plans which it receives in this manner in files available for inspection by the public." However, a shuffling of regional commissions over the study time period may have made maintaining the archives difficult at best. One official quipped that these plans, from the early 1990's, were so outdated and not used by anyone that there was no real impetus to keep them; another countered that a collection of archived plans should be maintained for reflection and would provide both academic and historic value. While it is beyond the scope of this research, there is clearly an ongoing debate about the value of historic plan documents.

There are 31 plan documents evaluated, including 36 unique plan policy sections that cover 65 jurisdictions; twenty of twenty-eight metropolitan Atlanta counties and 45 of 130 cities are represented by these plans. Of these 31 plans, eleven are city plans alone, eleven are county plans alone, and nine are joint plans - including both counties and some or all of their internal cities. There are more unique policy sections, which are referred to henceforth as plans, for simplicity, because joint plans for Heard and Cherokee Counties provided separate policy sections for each jurisdiction. Nineteen of these 36 plans (and 33 of 65 observations) are from before the year 2000. Coded plans include a combined 2564 policy statements. While representativeness of the cases is described here for the context, the representativeness of these cases will be returned to in the discussion of sustainable development results.

[2] I must note here that this was not a universal problem. Many of the plans included in this research were obtained by helpful public servants who searched their archives and took the time to mail or scan documents.

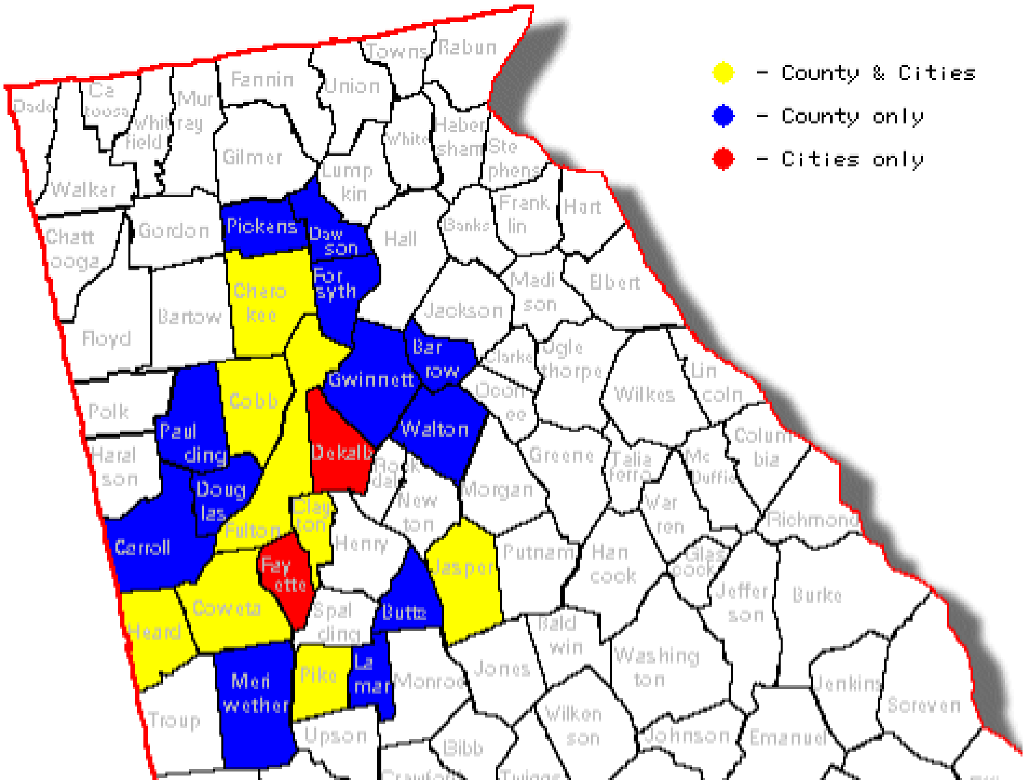

Figure 45: Map showing counties with evaluated plans

5.5.1 Representativeness of cases

Because the plans and their respective jurisdictions included in this research are based on a convenience sample, it is particularly important to understand how they relate to the metropolitan region as a whole. In this section, the contextual variables described in Section4.2 are included for the sub-cases and compared to metropolitan Atlanta as a whole.

Sub-cases were identified in 22 of 28 counties across metropolitan Atlanta. Figure 45 shows where plans were found and whether the case is only the county, only cities within the county, or includes the county and some or all of its cities.

Comparing Figures 45 and 15, shows that plans were identified for some jurisdictions in all counties of the urban core, in all but one of the suburban ring, and all but four of the fringe. Even though tiers have representation from most, if not all, counties, they do not have full coverage. Table 21 shows the number of jurisdictions for which plans are evaluated in this dissertation research compared with the total number of jurisdictions. On average, one-quarter of jurisdictions are covered as sub-cases.

Table 21: Jurisdictions with evaluated plans, by tier

Plan?	Core	Suburban	Fringe	Total
No	22	28	67	117
Yes	6	12	23	41
Total	28	40	90	158
Portion	21.4%	30%	25.6%	25.9%

5.5.1.1 Characteristics of the jurisdiction

Characteristics of the jurisdiction are shown for counties and cites, by whether or not a plan is evaluated in this dissertation (see Tables reftab:charjurhvplancnty and tab:charjurhvplancity). Places with plans are not significantly different from metropolitan Atlanta places that they represent in jurisdiction characteristics.

Table 22: Jurisdiction Characteristics by Plan Evaluated, Counties

Plan	Population	Pop Growth	Ideology	Live & Work
No	147118.75	1.00	0.92	0.28
	(212583.00)	(0.80)	(0.90)	(0.10)
Yes	155247.75	1.08	0.74	0.28
	(234396.40)	(0.78)	(0.53)	(0.10)
Total	152925.18	1.06	0.79	0.28
	(224483.78)	(0.77)	(0.64)	(0.10)

Table 23: Jurisdiction Characteristics by Plan Evaluated, Cities

Plan?	Pop	Pop Grow	Live & Work
No	13798.84	1.07	0.17
	(46434.36)	(1.80)	(0.13)
Yes	5163.78	0.92	0.17
	(10822.33)	(2.16)	(0.13)
Total	10809.78	1.02	0.17
	(38222.51)	(1.93)	(0.13)

5.5.1.2 Characteristics of the population

Characteristics of the jurisdiction are shown for counties and cites, by whether or not a plan is evaluated in this dissertation (see Tables reftab:charpophvplancnty and tab:charpophvplancity). Places with plans are not significantly different from metropolitan Atlanta places that they represent in this population characteristics, except for Asian population. Places with plans evaluated here have significantly lower Asian populations as a percent of total population than other places in metropolitan Atlanta; however, the Asian population is less than 2% across the entire metropolitan area.

Table 24: Population Characteristics by Plan Evaluated, Counties

Plan?	Income	Poverty	White	Black	Asian	High School	College
No	49911.74	0.10	0.75	0.21	0.02	0.78	0.21
	(12862.00)	(0.05	(0.18)	(0.16)	(0.01)	(0.10)	(0.11)
Yes	48353.81	0.10	0.77	0.19	0.01	0.77	0.19
	(10036.06)	(0.04	(0.16)	(0.15)	(0.02)	(0.07)	(0.10)
Total	48798.94	0.10	0.76	0.19	0.01	0.77	0.20
	(10690.27)	(0.04)	(0.16)	(0.15)	(0.02)	(0.08)	(0.10)

Table 25: Population Characteristics by Plan Evaluated, Cities

Plan?	Income	Poverty	White	Black	Asian	High School	College
No	45017.05	0.12	0.71	0.21	0.02	0.75	0.20
	(16287.52)	(0.06)	(0.22)	(0.20)	(0.04)	(0.12)	(0.14)
Yes	39925.87	0.12	0.72	0.24	0.01	0.71	0.15
	(9471.86)	(0.08)	(0.21)	(0.21)	(0.01)	(0.10)	(0.11)
Total	43254.72	0.12	0.72	0.22	0.02	0.73	0.18
	(14465.67)	(0.07)	(0.21)	(0.20)	(0.03)	(0.11)	(0.13)

5.6 Relating plans to development

5.6.1 Correlation

Because the idea is to discover whether or not a relationship between planning and development exists, correlation offers a useful first step. Correlations test for the portion of the variance of one variable that can be explained by change in another. Directly, the square of a correlation coefficient is the amount of variance explained. In this dissertation, correlations are used to assess the nature of relationships of pairs of variables.

5.6.2 Regression analysis

In order to assess the relationship between planning and development taking into account the context variables, regression analysis was also used. Regressions test how well a model (Right Hand

Side) explains the variation in a dependent variable. Detailed information about context variables is provided in Section 4.2 and specifically for places with plans in Section 5.5.1.

For each dimension of sustainable development and overall, a series of regressions was conducted with the development measure (change in welfare) for the dimension as the dependent variable. The first regression model is for jurisdiction characteristics (Equation 32); political ideology is a variable only available at the county level, so it is dropped in the overall model.

$$\Delta GPI = \alpha + \beta(\text{Population}) + \beta(\text{Pop Grow}) + \beta(\text{Ideology}) + \beta(\text{Live \& Work}) + \epsilon \tag{32}$$

The second regression model is for population characteristics (Equation 33).

$$\Delta\text{GPI} = \alpha + \beta(\text{Percent Black}) + \beta(\text{Percent Asian}) + \beta(\text{HH Inc}) \tag{33}$$

$$+\beta(\text{Percent Poverty}) + \beta(\text{Percent HS}) + \beta(\text{Percent BS}) + \epsilon \tag{34}$$

For each dimension of sustainable development and overall, two planning context regressions were calculated to determine if the year of the plan and whether or not plans were joint was significant. These regression models are of the form shown in Equation 35 for plan quality and Equation 36 for plan commitment to sustainable development. If year or joint planning are found to be significant for the plan quality or commitment to sustainable development in a dimension, these variables are retained for the overall regression as the planning context.

$$PQ = \alpha + \beta(\text{Year}) + \beta(\text{Joint}) + \epsilon \tag{35}$$

$$CSD = \alpha + \beta(\text{Year}) + \beta(\text{Joint}) + \epsilon \tag{36}$$

The overall equation for each dimension and for all development is of the form of Equation 37, and for each dimension, it includes the context variables of importance to the previous models. For example, the economic dimension may have different jurisdiction variables found to be important than the resource dimension. While jurisdiction, population, and planning context variables may change, each regression includes the plan quality score and the commitment to sustainable development as independent variables.

$$
\begin{aligned}
\Delta\text{GPI} \quad = \quad & \alpha + \beta(\text{Jurisdiction context}) + \beta(\text{Population context}) + \beta(\text{Planning context}) && (37) \\
& + \beta(\text{Plan Quality}) + \beta(\text{Plan CSD}) + \epsilon && (38)
\end{aligned}
$$

CHAPTER VI

RESULTS AND DISCUSSION

Results are presented in four sections. First, the measures of sustainable development are pulled together in Section 6.1. Then, the results of the plan policy statement content analysis for plan quality are presented, followed by the results of the content analysis for commitment to sustainable development and the relationship between the two (Section 6.2). The relationship between planning and sustainable development is discussed in Section 6.3. Alternative explanations are discussed in Section 6.4.

6.1 Development in Metropolitan Atlanta

This section first describes the change in welfare over time for the whole of metropolitan Atlanta, using the GPI. Each dimension of sustainable development is then addressed individually. An assessment of the reasonableness of the GPI as a measure of welfare for metropolitan Atlanta is included using the HDI in Section 6.1.3. Development results are discussed in Section 6.1.4 relating to theoretical arguments about development and contextual variables. Because plans are only evaluated for some of the jurisdictions in Atlanta, Section 6.3.1 shows the development measures for the included jurisdictions in comparison to the whole of metropolitan Atlanta. A summary of this section on development in metropolitan Atlanta is presented in Section 6.1.6.

6.1.1 Sustainable development in metropolitan Atlanta? (GPI)

Recall that sustainable development was defined as non-declining welfare and welfare is measured in this dissertation by the GPI per capita. Figure 46 shows that the GPI per capita was increasing for all of Georgia and the focused portions of metropolitan Atlanta from 1980 to 1990; however, both the state and the city of Atlanta show declines after 1990. Fulton county outpaced improvements in welfare for the average of metropolitan Atlanta.

Overall, these results suggest that development has been sustainable, at least weakly, for these jurisdictions. The city of Atlanta shows a welfare improvement with GPI per capita in 2000 at 2.14

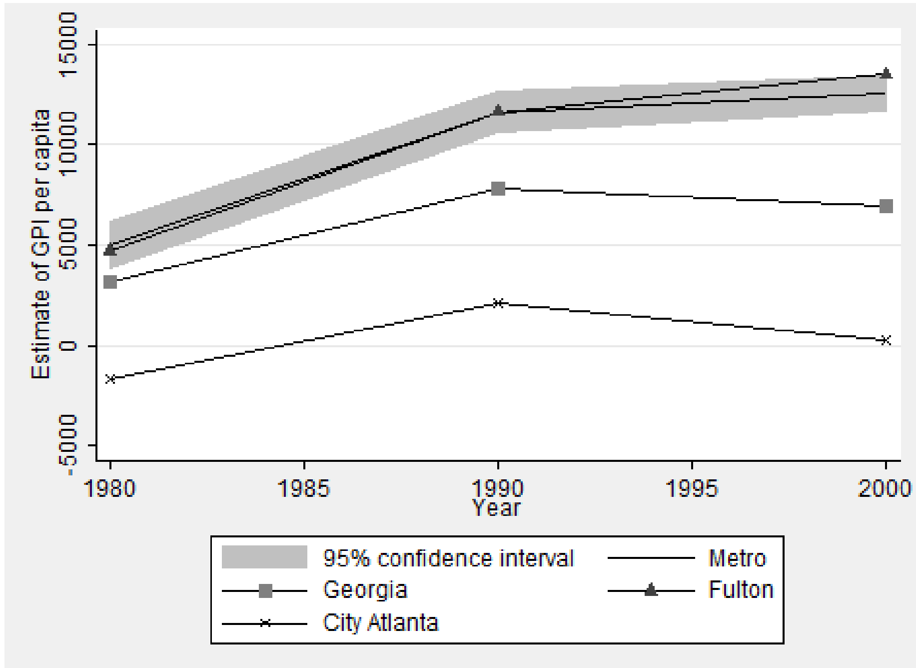

Figure 46: GPI Per Capita for Georgia and Atlanta

times the value in 1980; this improvement also brought the city of Atlanta welfare above zero. The state of Georgia fairs slightly better with 2.18 times 1980's GPI per capita in 2000. Metro Atlanta has a mean 2000 GPI per capita of 2.52 times the GPI per capita in 1980 with a standard deviation of 0.66. Nearly tripling welfare, Fulton county has GPI per capita in 2000 at 2.84 times its value in 1980.

Not all of metropolitan Atlanta shows sustainable development based on the overall GPI. While all counties had welfare at least as good in 2000 as 1980, seventeen of 130 cities did not. Table 26 shows these cities, their respective counties, and their change in GPI per capita from 1980 to 2000 as a portion of GPI in 1980. Bowdon in Carroll county showed a negative change of less than one percent, but Oxford in Newton county had welfare in 2000 of about twenty percent of the welfare in 1980 (a decrease in welfare of 78.6 percent of 1980 value). Factors affecting decline in these places will be addressed more in the discussion of dimensions of sustainable development, below.

6.1.1.1 Sustainable development in RDCs?

Breaking down the whole metro Atlanta region into the segments representing different RDCs shows how growth varies across the region (see Figure 47). Note that the graph shows the confidence

Table 26: Unsustainable cities based on relative change in GPI per capita

County	City	Δ GPI
Carroll	Bowdon	-0.004
Clayton	Forest Park	-0.118
Clayton	Lovejoy	-0.301
DeKalb	Chamblee	-0.103
DeKalb	Clarkston	-0.211
DeKalb	Lithonia	-0.379
Fulton	College Park	-0.172
Fulton	East Point	-0.11
Heard	Franklin	-0.214
Jasper	Shady Dale	-0.141
Meriwether	Gay	-0.212
Meriwether	Greenville	-0.071
Meriwether	Luthersville	-0.287
Meriwether	Manchester	-0.115
Newton	Oxford	-0.786
Newton	Porterdale	-0.221
Pike	Zebulon	-0.077

Table 27: Relative change in GPI per capita for RDCs, (change in GPI):GPI1980

RDC	Mean	(SD)
Chattahoochee Flint	1.222	(0.525)
McIntosh Trail	1.371	(0.459)
Atlanta Regional Commission	1.414	(0.453)
Northeast Georgia	1.491	(0.544)
North Georgia	2.25	N/A
Coosa Valley	2.482	(0.555)
Georgia Mountains	3.591	(1.331)

interval for the whole metro, but confidence intervals are not shown for the individual RDCs in order to keep the graph readable because the confidence intervals overlap. While the Atlanta Regional Commission trends near the top of metropolitan Atlanta, all but one RDC show much lower absolute performance but similar changes. The Georgia Mountains RDC stands out having the only growth that appears just as robust from 1990 to 2000 as was seen from 1980 to 1990.

While all RDCs show an average improvement in welfare, or sustainable development overall, the changes by 2000 range from just a little bit better than 1980 in Chattahoochee Flint to nearly four times as well off in Georgia Mountains RDC. Table 27 shows the mean and standard deviations for the change in GPI from 1980 to 2000 relative to its value in 1980 for each RDC; since there is only one county from the North Georgia RDC in metro Atlanta, the value is shown as the mean.

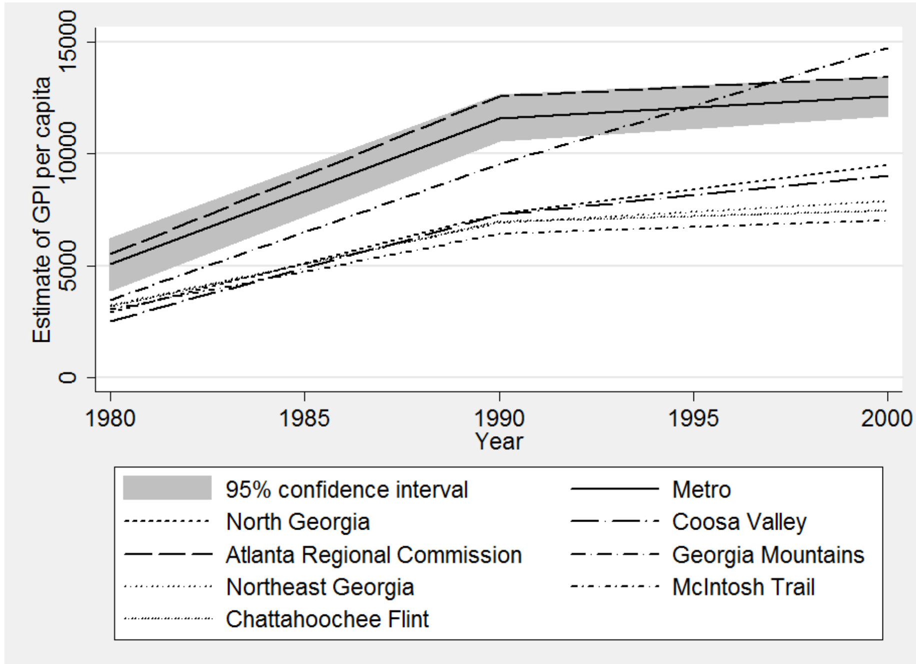

Figure 47: GPI Per Capita for RDCs

Table 28: Relative change in GPI per capita for tiers, (change in GPI):GPI1980

Tier	Mean	(SD)
Core	1.356	(0.517)
Suburban Ring	1.579	(0.508)
Fringe	1.728	(1.033)

6.1.1.2 Sustainable development across urban area?

Development in the urban core largely reflects the overall metro pattern, while the suburban ring does better and the fringe does worse, in absolute terms. Figure 48 shows the average GPI per capita for metro Atlanta and each tier. Confidence intervals were dropped for the tiers because the urban core and suburban ring intervals overlap; the fringe confidence interval is wholly separate for 1990 and 2000, indicating a significant difference in absolute welfare for these years.

When averaging across the tiers, relative change is fairly consistent. The urban core and suburban ring, while better off than the fringe in absolute terms, show less relative improvement from 1980 to 2000. The differences between tiers are not significant because of large variances (see Table 28). Reflecting on both Figure 48 and Table 28, it appears that development in the fringe counties is on track to catch up to the core and suburban ring.

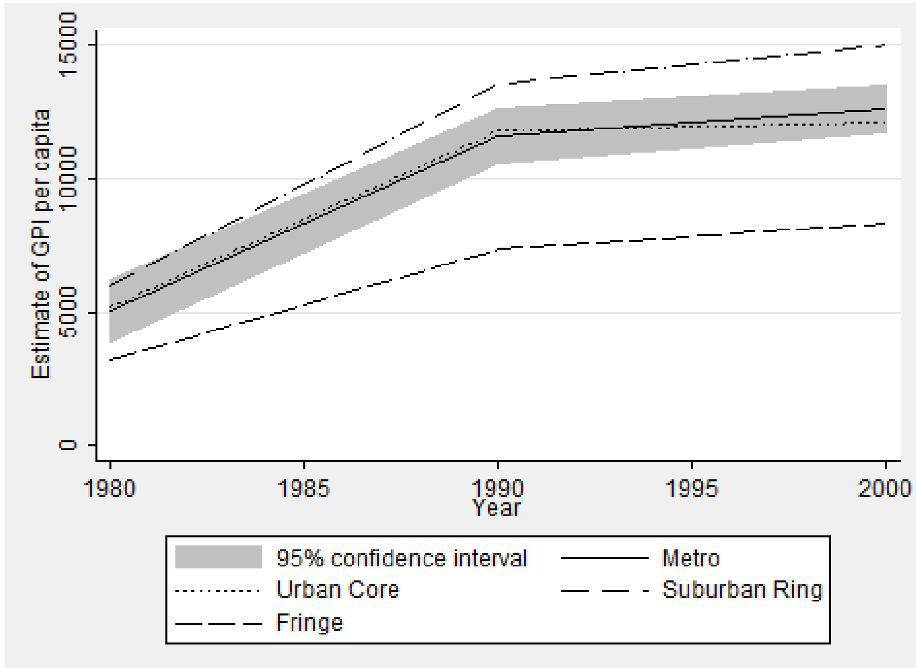

Figure 48: GPI Per Capita for Urban Tiers

6.1.2 Sustainable development by dimension in metropolitan Atlanta?

From overall GPI measures of welfare, it appears that the metropolitan area is weakly sustainable. To determine if it is strongly sustainable, each dimension of sustainability must also be at least as large in 2000 as in 1980. The relative contribution of each dimension to the overall GPI is also of interest, from both a philosophical standpoint (does the relative contribution make sense for what we might conceptualize as sustainability?) and a methodological standpoint (does the relative contribution make sense for trying to represent welfare?).

Figure 49 shows the contributions by dimension to the GPI per capita for metropolitan Atlanta. Two observations are immediately obvious: The economics dimension dominates the economics dimension is the only one with a positive contribution. This means that, on average, metropolitan Atlanta is offsetting declines in social, environmental, and resource welfare with economic welfare. The following sections will look at each dimension more closely.

6.1.2.1 Economic development

Recall from the methodology that the economic dimension is measured by the sum of the inequality-adjusted income, non-market contributions of household labor and volunteer labor, and the costs of

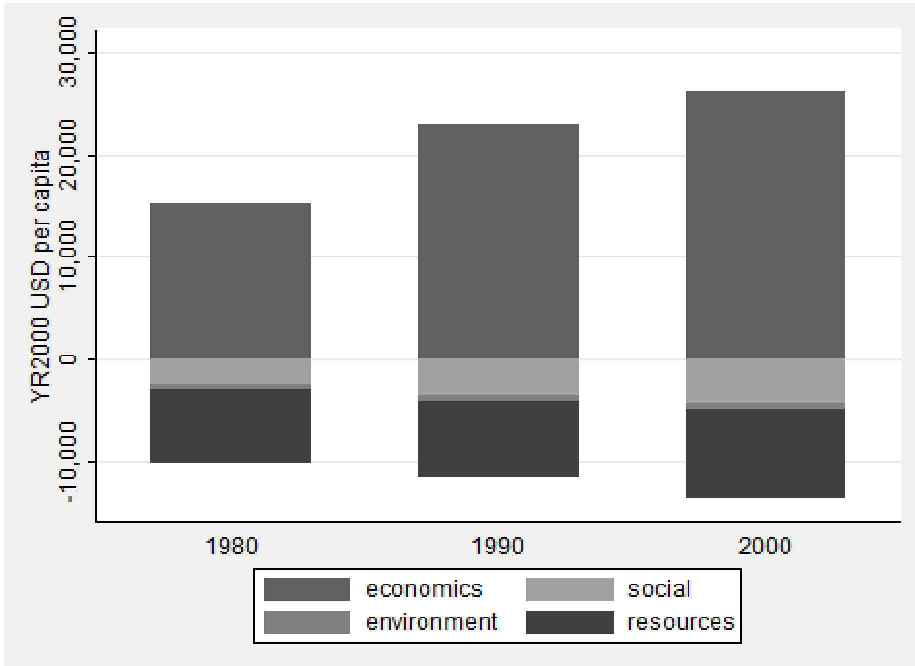

Figure 49: GPI Per Capita by Dimension

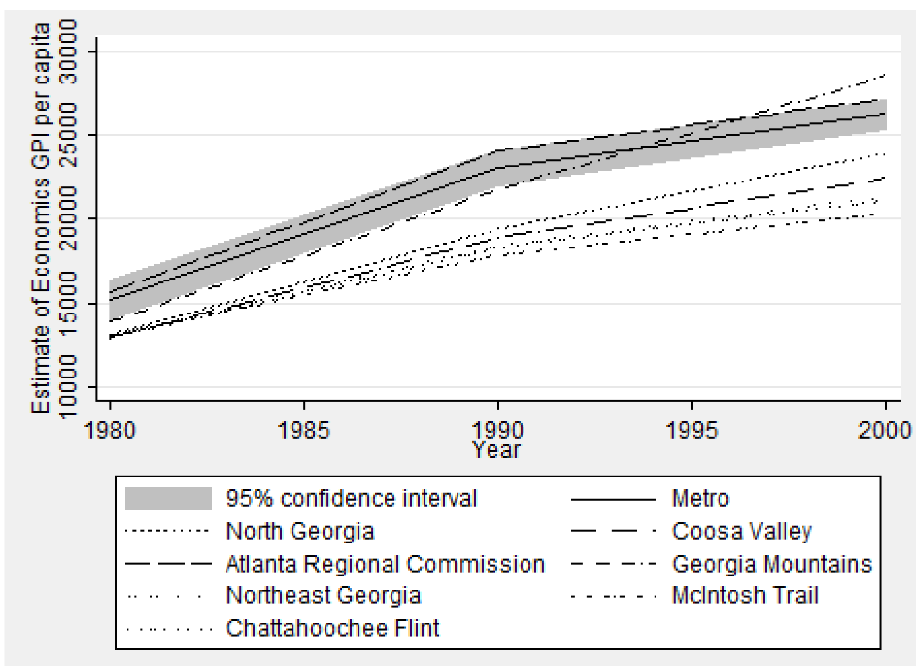

Figure 50: GPI per capita, economic dimension, by RDC

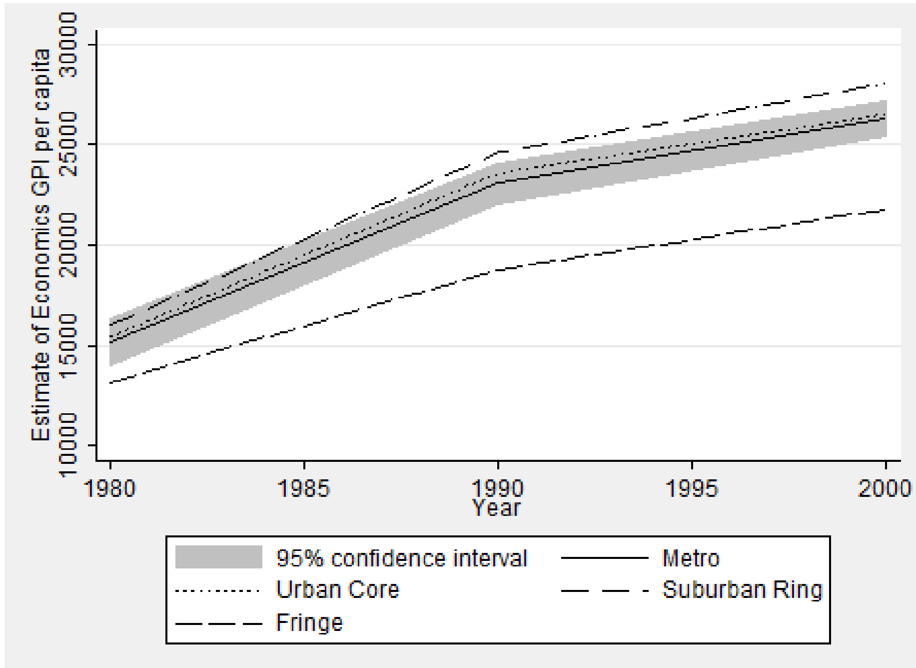

Figure 51: GPI per capita, economic dimension, by tier

underemployment. Figure 52 shows how these add up for metropolitan Atlanta. Income is the largest contributor, followed by the estimate of the value of household labor. The estimated value of volunteer labor and costs of underemployment are relatively small.

All jurisdictions in metro Atlanta show sustainable development in the economics dimension - every jurisdiction's economic welfare in 2000 was at least as large as in 1980.

6.1.2.2 Social development

Three jurisdictions in metro Atlanta show sustainable social development; they are the cities of: Braswell (in Paulding County, Coosa Valley RDC, fringe), Sunny Side (in Spalding County, McIntosh Trail RDC, fringe), and Talking Rock (in Pickens County, North Georgia RDC, fringe). Despite their improvements, the absolute social welfare for these three jurisdictions was still negative in the year 2000, so they may be getting better, but negative social welfare is still undesirable. All others show a decline in social welfare representing unsustainable social development. This may be an artifact of measurement; some things which contribute to positive social welfare, such as friendship and health, are not measured here.

Looking at the changes in social welfare over time for metro Atlanta and its component RDCs

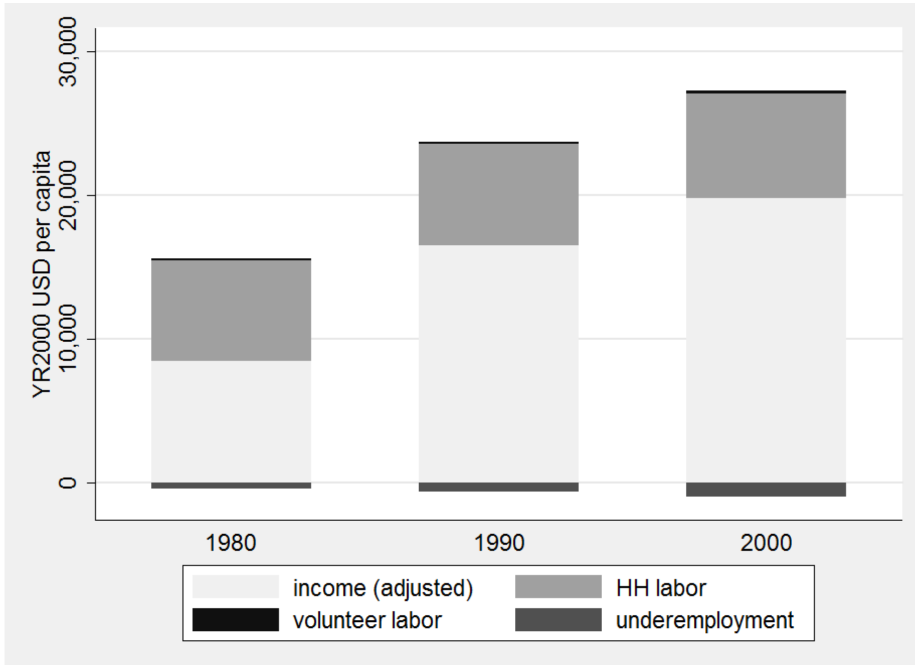

Figure 52: GPI per capita, economic dimension, by measure

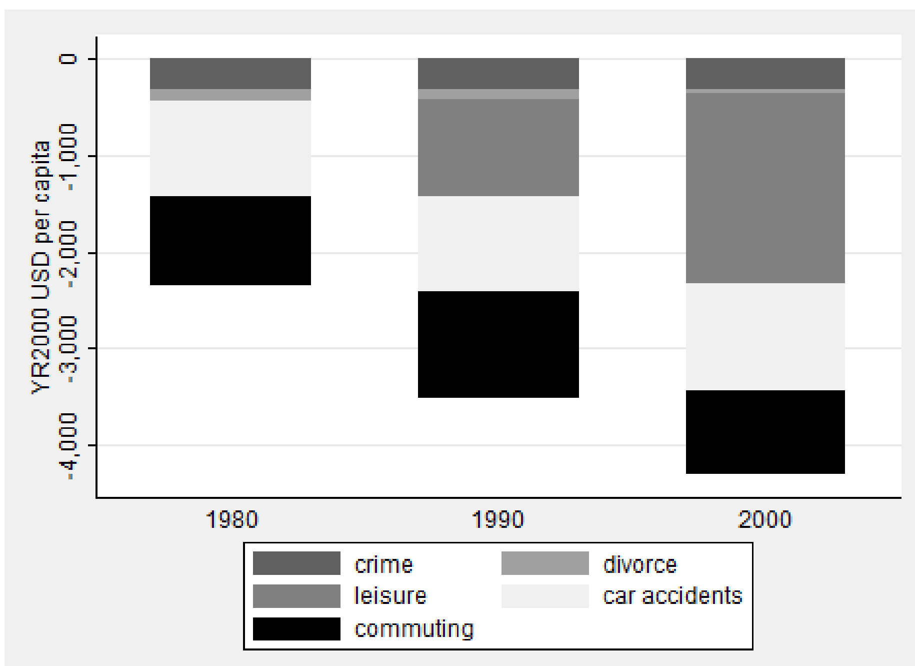

Figure 53: GPI per capita, social dimension, by measure

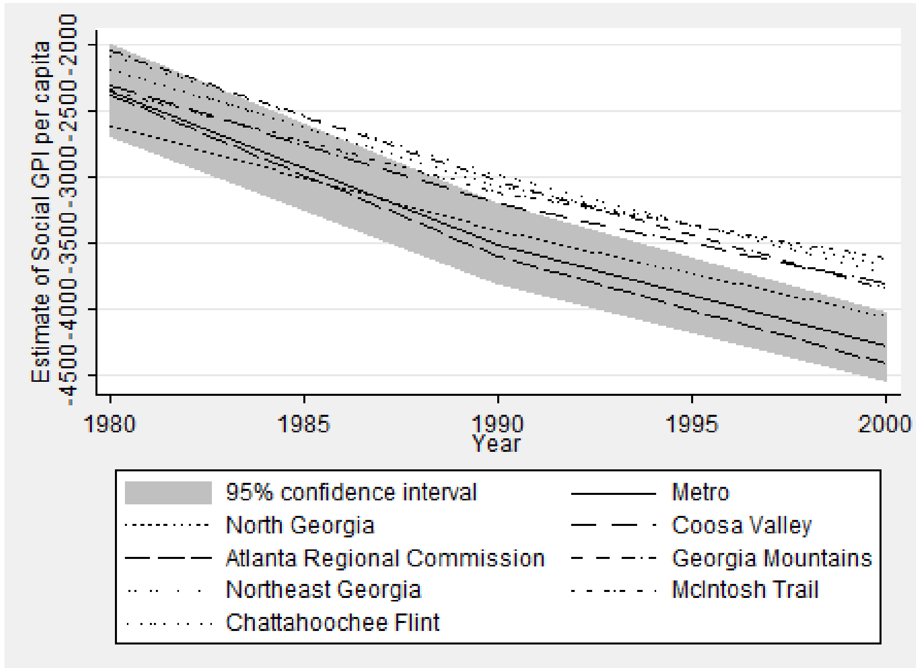

Figure 54: GPI per capita, social dimension, by RDC

shows that the decline in social welfare varies by area of Atlanta with the Atlanta Regional Commission (10 central counties) showing faster social decline than the rest of the metropolitan area.

Similarly, when looking at metro Atlanta as urban tiers, it is clear that social decline is much faster in the urban core than in the suburban ring or fringe, which run almost parallel to each other. Social welfare is noticeably more disparate in 2000 between the urban core and the outer rings (see Figure 55). In the urban core, crime rates are higher than outside of the core. High concentrations of lower income populations in the urban core may contribute to this finding.

6.1.2.3 Environment development

While environmental welfare remains negative for metro Atlanta throughout the study period, it is getting better for about half of the region. Eighteen counties (of 28) and 83 cities (of 130) have sustainable environmental development; despite the positive change in this dimension, the absolute value of the environment dimension remains negative.

Looking at the environment dimension for metro Atlanta and its component RDCs in Figure 56, Coosa Valley RDC stands out with a dramatic improvement in environmental welfare. Northeast

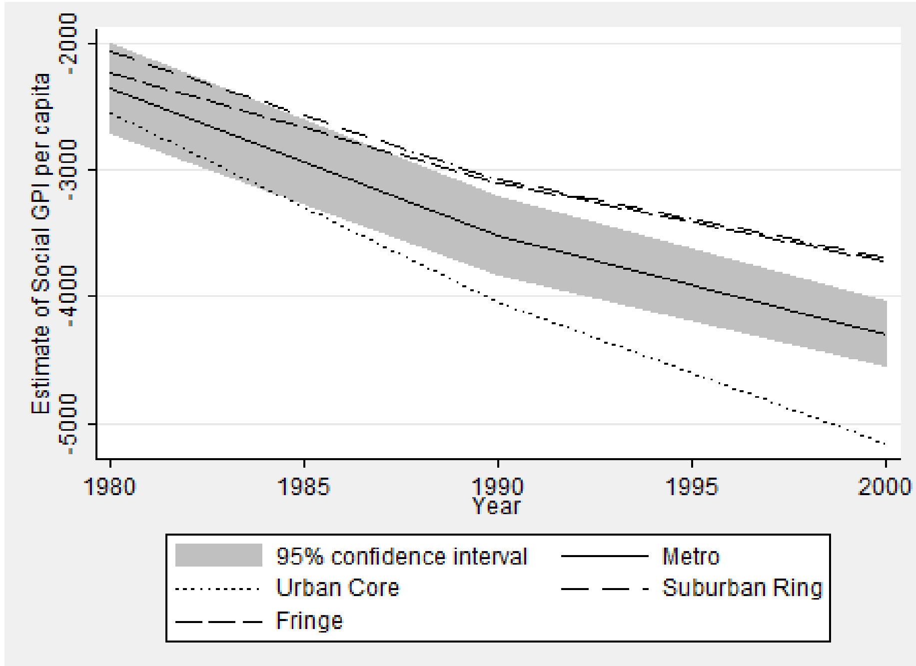

Figure 55: GPI per capita, social dimension, by tier

Georgia and North Georgia RDCs show small declines while the remaining RDCs show improvements.

By urban tier, metropolitan Atlanta shows the effect of development on environmental welfare. The suburban ring showed steady improvement from 1980 to 2000 in environmental welfare with more mixed results in the urban core and fringe (see Figure 57).

All components of the environment dimension appear to be improving together on average (see Figure 58). This could be due to effective environmental regulations or errors in specification or measurement. The potential for measurement error is of concern because noise pollution is estimated purely by the portion of the place which is considered urban and air and water pollution estimates are based on values of clean air and water resources which may not reflect their actual values to the people of metro Atlanta and on levels of "pollutedness" that are rough at best since data are not available at the level of detail necessary to properly assess pollution. Even if average air, water, and noise pollution were sufficiently determined for a county, there remains the problem of local differences, where high local concentrations may make the pollution much more costly to any particular part of a jurisdiction. Threshold effects could also play a role but are not considered here.

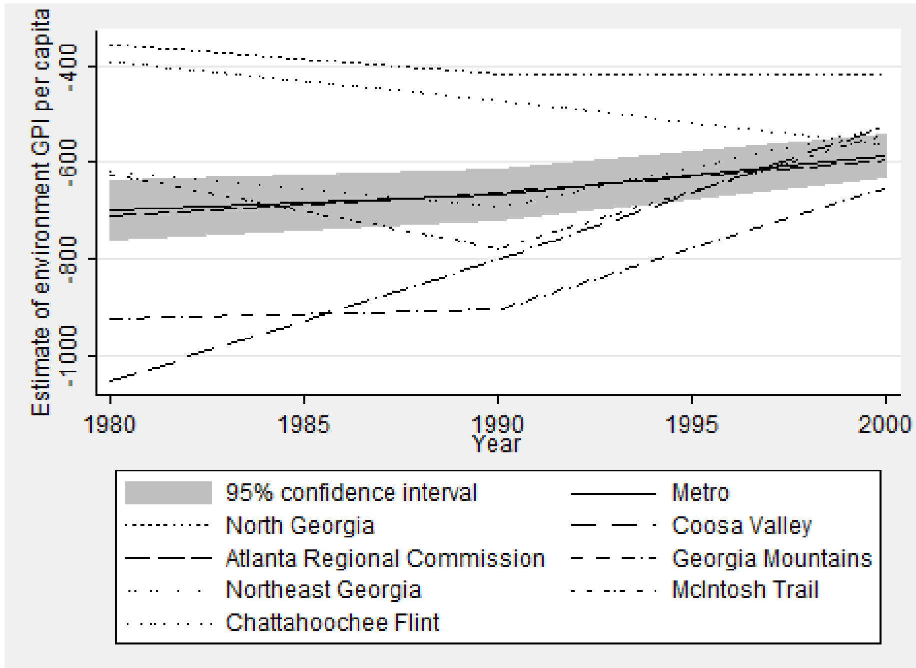

Figure 56: GPI per capita, environment dimension, by RDC

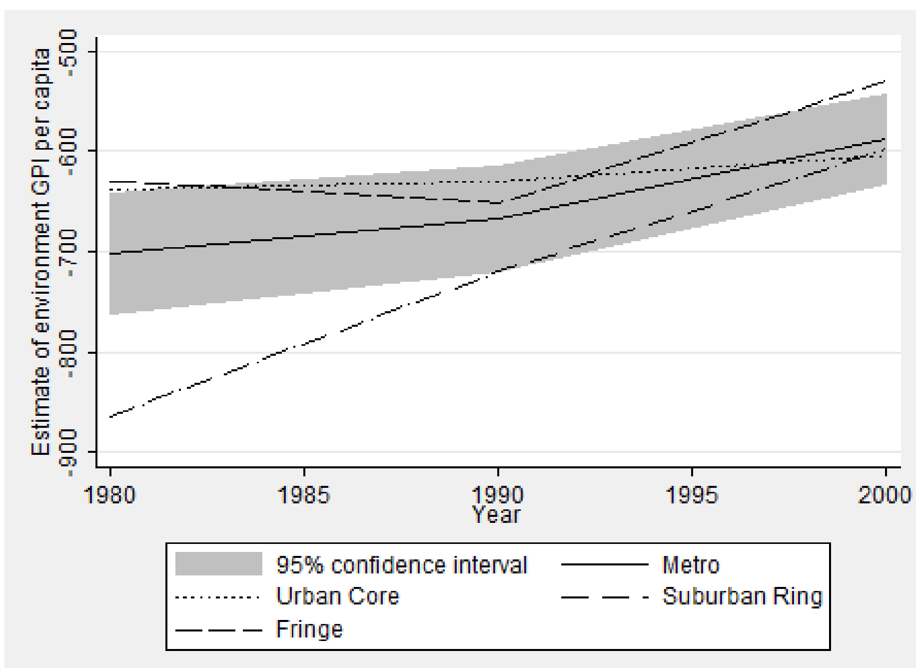

Figure 57: GPI per capita, environment dimension, by tier

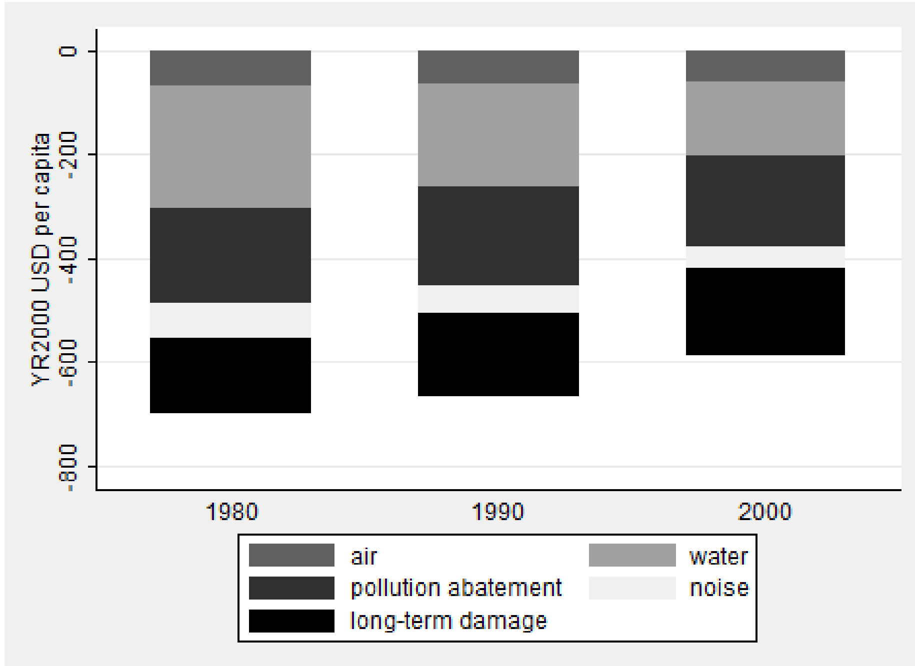

Figure 58: GPI per capita, environment dimension, by measure

6.1.2.4 Resource development

No jurisdiction in metro Atlanta has sustainable resource development. Based on Figure 59, it appears that the decline in resource welfare was worse from 1990 to 2000 than 1980 to 1990. The swiftest decline in resource welfare occurred in North Georgia RDC (recall that only Pickens County from North Georgia RDC is part of metro Atlanta).

Looking again at metro Atlanta from the perspective of urban tiers, the urban core appears to have the least decline in resource welfare while the greatest decline occurred in the suburban ring (see Figure 60). This may be partially do to heavy development in the urban core before the study period; for example, land cannot be "lost" to development during a period if it was already developed. However, some speculate that energy consumption could be lower for higher density populations, like are present in the urban core. If this is true in Atlanta and energy data were available at the local level rather than a population weighted state average, resource welfare in the urban core might be even higher.

The bulk of the negative welfare in resources is due to the costs of natural resource depletion. However, man-made resources also have a composite negative effect. Figure 61 shows how these

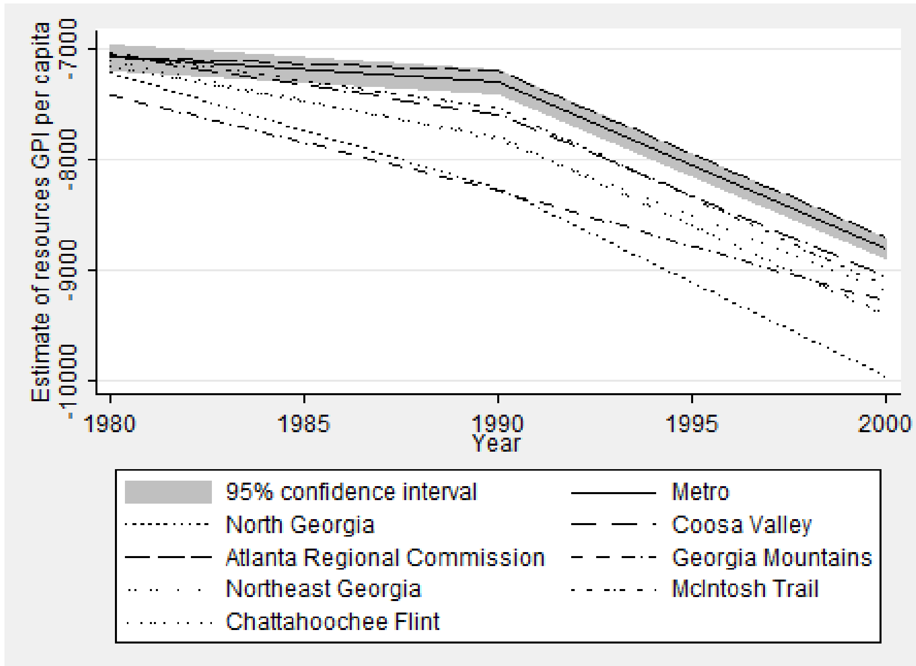

Figure 59: GPI per capita, resource dimension, by RDC

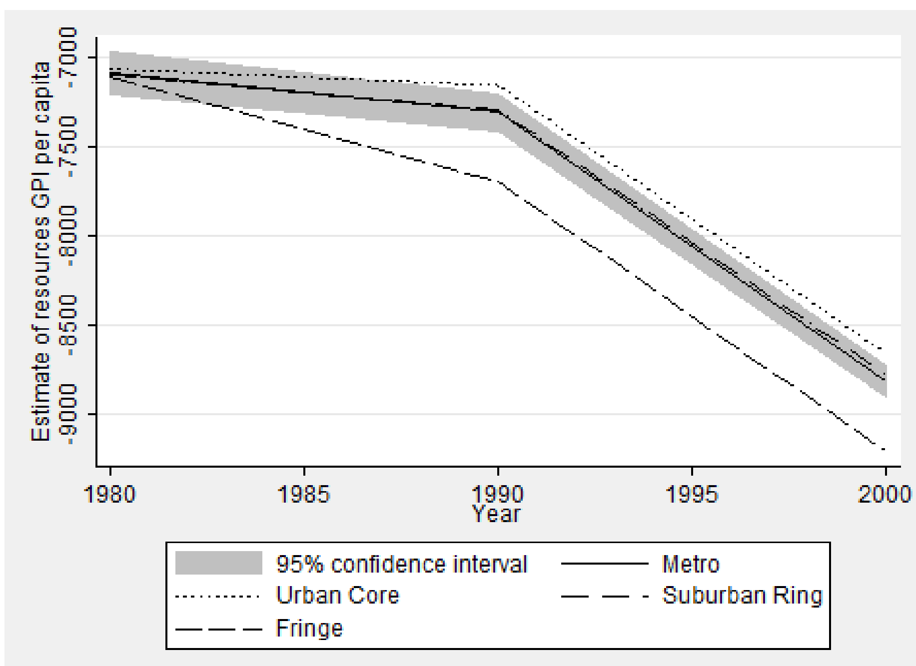

Figure 60: GPI per capita, resource dimension, by tier

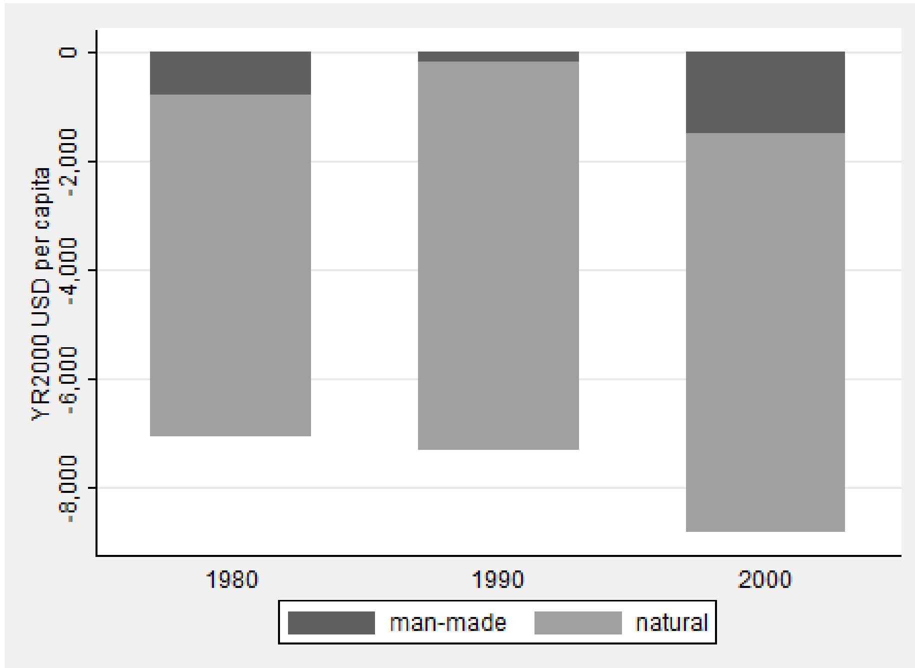

Figure 61: GPI per capita, resources dimension, by type

two types of resources add up for metro Atlanta.

There are no jurisdictions in metropolitan Atlanta where the estimate of resource welfare is better in 2000 than in 1980. While this appears troubling because we assume that losses in natural resources are made up for in man-made resources, it is also related to the method of calculation. Here, an attempt has been made to represent man-made resources with the value of public roads, the net capital investment, and the net value of consumer durable goods. While a worthwhile effort, this method may suffer from errors of omission. Of course, the true net value of natural resource welfare is also difficult to estimate. Here, the method uses the net value of forest, wet, and farm lands, the cost of ozone depletion, and the cost of consumption of non-renewable energy resources. Astute readers will immediately point out that renewable resources that are over-consumed are in no way accounted for here and non-renewable resources consumed for purposes other than energy are also overlooked. In addition, the only resource measures available for the local level are those for land conversion; other resources are based on a higher jurisdiction, like the state for energy consumption and the nation for net capital investment, and then population or other-wise weighted to the local

Year	Literacy percent	Life Expectancy years	Income YR2000$
1980	80.78	72.87	5517
1990	80.78	74.22	11066
2000	85.50	75.34	12708

level.[1]

6.1.3 GPI, a reasonable welfare measure for Atlanta?

The HDI measures welfare based on the knowledge (literacy), health (life expectancy), and purchasing power (income) of the population. HDI was calculated in addition to the GPI as an alternative and a check on the GPI as a measure of welfare. Due to data availability, HDI is only assessed at the county level. Mean values of literacy, life expectancy, and income (adjusted for income inequality) have increased for metropolitan Atlanta.[2]

Based on mean HDI values for the RDCs in metropolitan Atlanta, the disparity in welfare has increased since 1980 (see Figure 62). An increase in disparity of welfare indicates that local policies may not be addressing the needs of the poor. It may also represent a shrinking of the middle class.

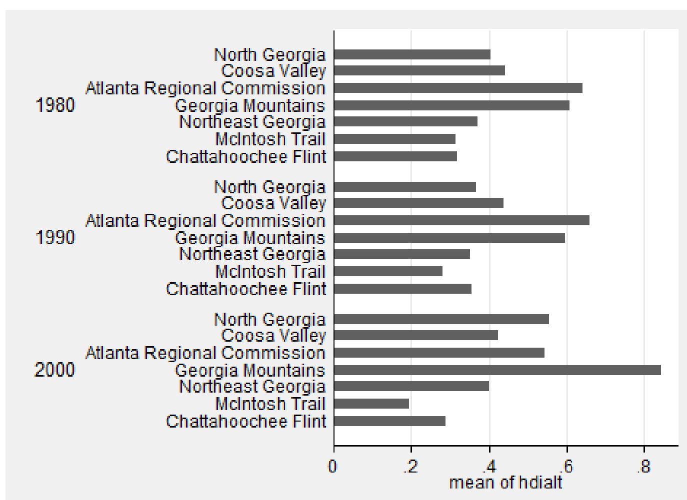

Figure 62: HDI by RDC and Year

Looking at the components indices alongside the HDI by RDC shows that Georgia Mountains dominates all indices with the next best RDC different based on the area. The Atlanta Regional

[1]The value of roads is based on local mileage, but the value of a mile of road is based a national average. Local road value may be different.

[2]Literacy values in 1990 are used for 1980, see Section 5.3.

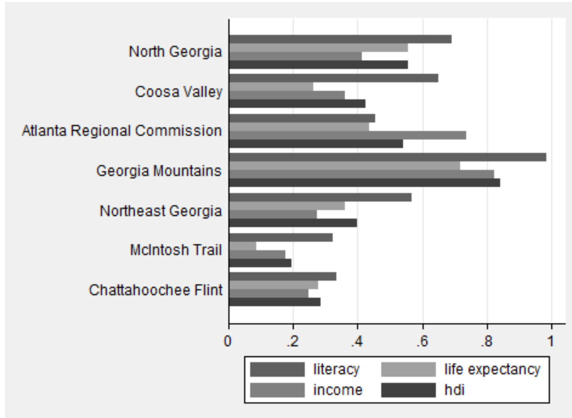

Figure 63: HDI and component indices by RDC, 2000

Commission has the second highest mean income index while North Georgia has the second highest literacy and life expectancy index values.[3]

Also, it is interesting to see the effect of inequality of income on measures of social welfare. Table 29 shows that income in 2000 adjusted for income inequality is more strongly related to higher literacy and higher life expectancy than unadjusted income. This confirms previous findings that income inequality has detrimental effects on the welfare in general.

Table 29: Welfare and Inequality

Variables	HDI	Literacy	Life Expectancy	Adj Income	Income
HDI	1.000				
Literacy	0.852	1.000			
	(0.000)				
Life Expectancy	0.890	0.635	1.000		
	(0.000)	(0.000)			
Adj Income	0.883	0.594	0.716	1.000	
	(0.000)	(0.001)	(0.000)		
Income	0.742	0.479	0.518	0.945	1.000
	(0.000)	(0.010)	(0.005)	(0.000)	

The HDI and the GPI show fairly good agreement; the relationship between HDI and GPI is strongest for overall GPI and the dimensions of economics and resources (see Figure 64). The correlation between HDI and GPI (and dimensions) is shown in Table 30. The HDI is significantly and positively correlated with Overall GPI and the economics and resources dimensions (at 1%).

[3]The only county in North Georgia that is in metropolitan Atlanta is Pickens County.

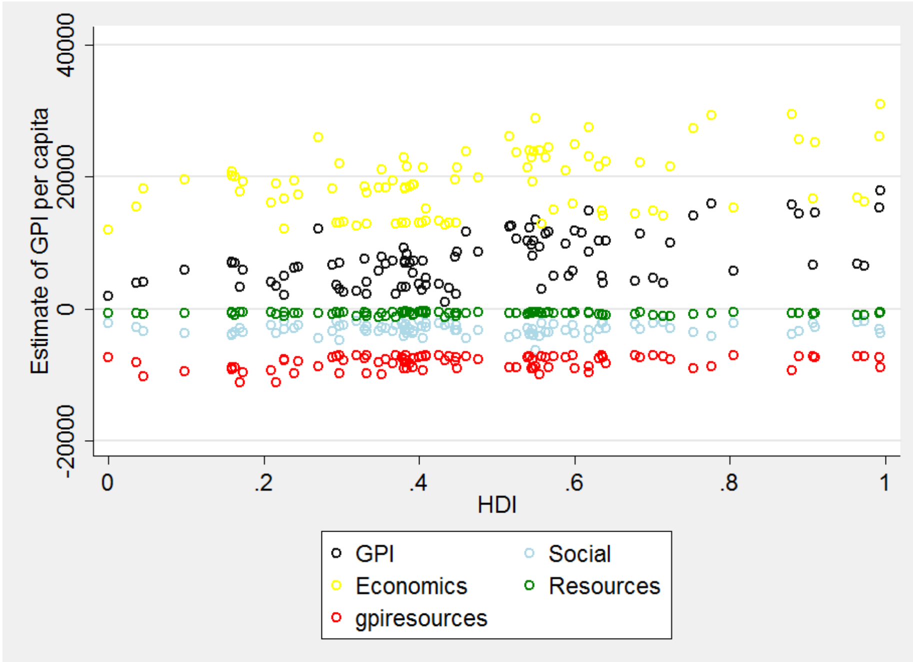

Figure 64: HDI and GPI, by dimension

However, the flat relationship with the social dimension indicates that the social measures of the GPI may not represent social welfare; this is particularly suprising because the HDI is supposed to be a reflection of social welfare, so the expectation is that the strongest relationship would be between the social dimension of GPI and the HDI. Another possibility is that the social dimension of welfare is not represented by income, which makes up one third of the HDI measure.

Table 30: Cross-correlation table for GPI and HDI

Variables	GPI	Social	Economics	Environment	Resources	HDI
GPI	1.000					
Social	-0.296	1.000				
	(0.000)					
Economics	0.919	-0.587	1.000			
	(0.000)	(0.000)				
Environment	0.240	-0.076	0.070	1.000		
	(0.000)	(0.099)	(0.127)			
Resources	-0.242	0.497	-0.469	-0.232	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)		
HDI	0.558	0.052	0.388	-0.129	0.310	1.000
	(0.000)	(0.627)	(0.000)	(0.226)	(0.003)	

As GPI increases, so does the indexed welfare measure of the HDI. Because both the GPI and

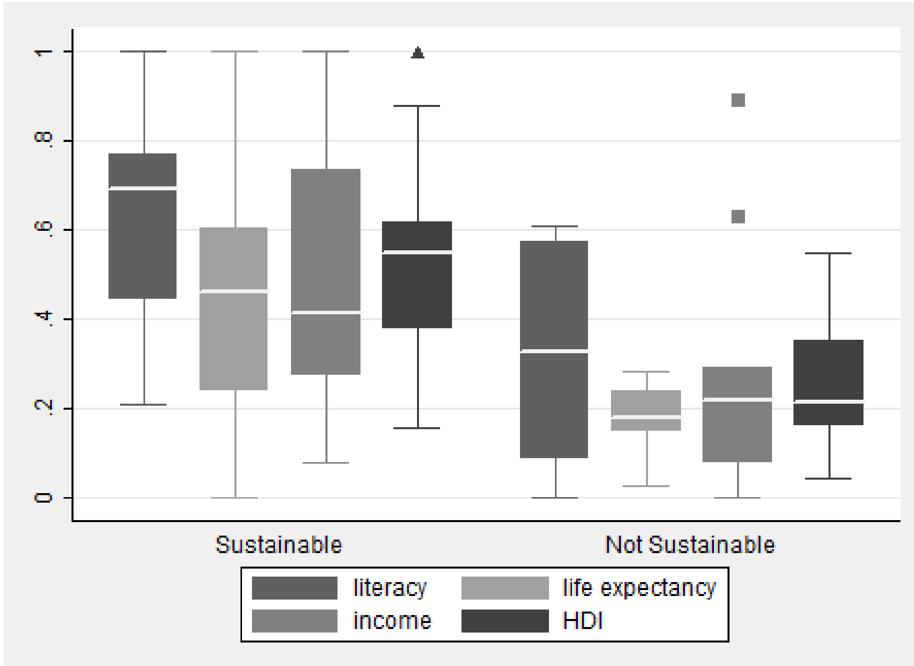

Figure 65: HDI by sustainable based on GPI

the HDI have been used to measure welfare in international contexts, the confirmation of their correlation for the local scale suggests that the GPI is a reasonable measure of welfare for metropolitan Atlanta. Whether or not the GPI (or any measure for that matter) is a good indication of actual welfare is always open to discussion.

Recall that seventeen cities were found to have unsustainable development from 1980 to 2000. Box plots in Figure 65 show the variation in the measures of the HDI for the counties of those cities that are and are not developing sustainably. Because the HDI cannot be measured at the city level, and all of the counties have positive changes in GPI/capita, this comparison is a compromise. It is clear that the counties with non-sustainable cities have lower mean index scores for literacy, life expectancy, income, and the HDI.

6.1.4 Discussion of development and context

While relationships with planning characteristics will be discussed in Section 6.3, here the relationship between development and the characteristics of the jurisdiction and population are discussed.

Sustainable development as defined by ΔGPI is not significantly related to the characteristics of the jurisdiction when looking at all jurisdictions (see Table 31). The strongest relationship is with political ideology and it is negative, suggesting that more republican support is related to higher increases in welfare. Welfare in 2000 is significantly and positively correlated with both population and population growth.

Table 31: Correlation with Jurisdiction Characteristics

Variables	ΔGPI	GPI2000	Population	Pop Growth	Ideology	LiveWork
ΔGPI	1.000					
GPI2000	0.039	1.000				
	(0.624)					
Population	-0.027	0.178	1.000			
	(0.734)	(0.026)				
PopGrowth	0.061	0.187	0.018	1.000		
	(0.444)	(0.019)	(0.823)			
Ideology	-0.311	0.012	0.608	-0.400	1.000	
	(0.107)	(0.953)	(0.001)	(0.035)		
LiveWork	-0.105	-0.065	0.183	-0.098	-0.269	1.000
	(0.191)	(0.419)	(0.021)	(0.218)	(0.166)	

However, looking at the data reveals that there are three influential cases which skew the result (see Figures 66 and 67). These three instances are cities with small population which have improved substantially over the time period studied - all having changes GPI in 2000 more than 10 times higher than in 1980. Table 32 shows these influential cases, along with their change in welfare, welfare in 1980 and 2000, and population.

When these three observations are removed, both population growth and absolute welfare reveal themselves to be positively and significantly related to sustainable development, see Table 33.

No characteristics of the population are significantly correlated with development. However, all of the population characteristics, except the percent of the population which is of Asian race, are significantly correlated with welfare in the year 2000.

Table 32: Influential cases for GPI

City	ΔGPI	GPI 1980	GPI 2000	Population 2000
Aldora	15.979	170.78	2899.64	98
Hapeville	50.571	-104.81	5195.49	6180
Loganville	27.998	281.12	8152.07	5435

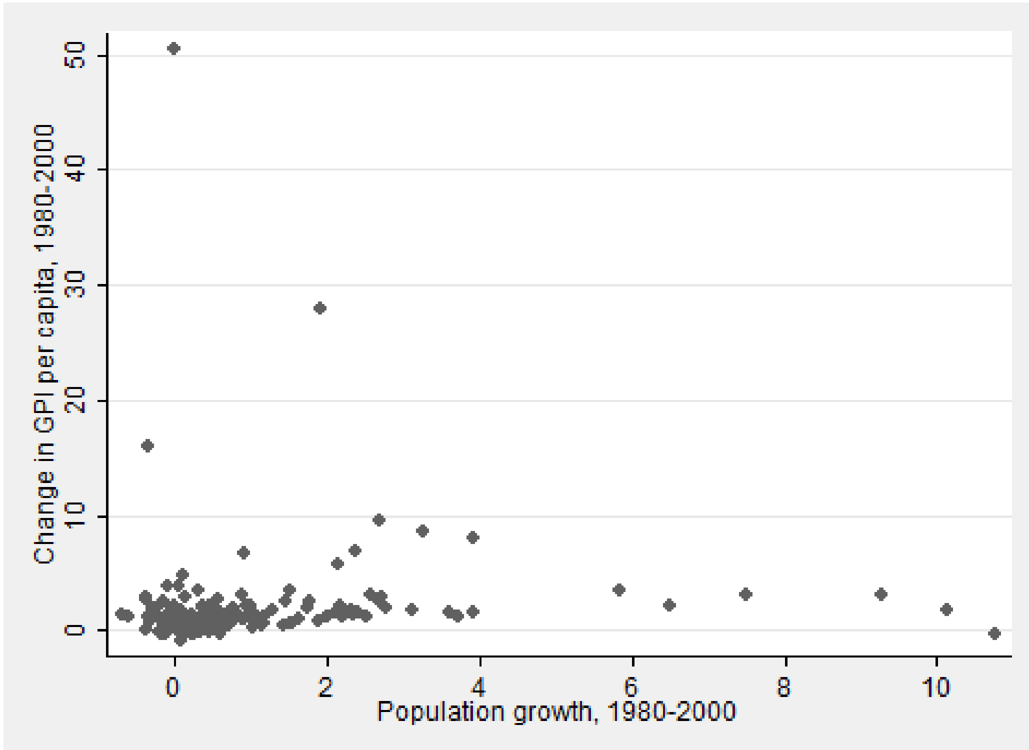

Figure 66: Population Growth and Change in GPI

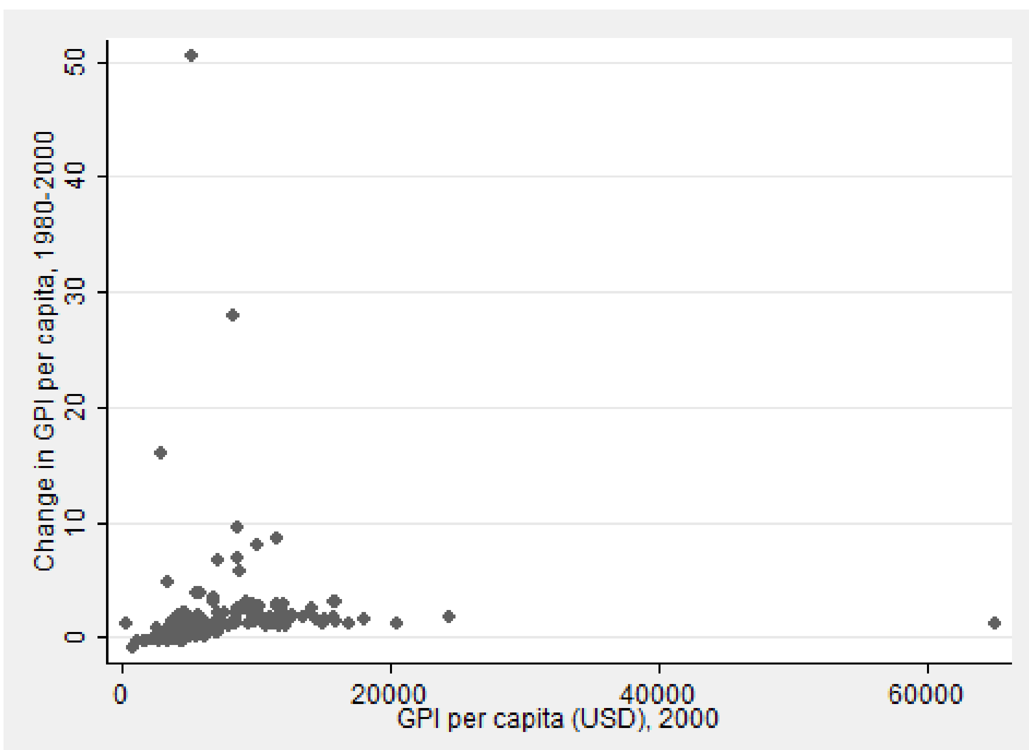

Figure 67: GPI 2000 and Change in GPI

Table 33: Correlation with Jurisdiction Characteristics with Outliers Omitted

Variables	ΔGPI	GPI2000	Population	Pop Growth	Ideology	LiveWork
ΔGPI	1.000					
GPI2000	0.234	1.000				
	(0.003)					
Population	0.016	0.176	1.000			
	(0.844)	(0.028)				
Pop Growth	0.292	0.183	0.016	1.000		
	(0.000)	(0.023)	(0.840)			
Ideology	-0.311	0.012	0.608	-0.400	1.000	
	(0.107)	(0.953)	(0.001)	(0.035)		
LiveWork	-0.073	-0.074	0.180	-0.108	-0.269	1.000
	(0.368)	(0.359)	(0.025)	(0.182)	(0.166)	

6.1.5 Sustainable development in sub-cases in metropolitan Atlanta?

After the previous discussion laid out an analysis of development in all of metro Atlanta, it is important to consider the development particularly of those jurisdictions which are included in the plan analysis and subsequent linking analysis.

Figures 68 and 69 show that counties for which plans are evaluated in this study are representative of all metro Atlanta counties, but cities for which plans are evaluated are not - these cities have higher than average GPI per capita, although the confidence intervals for the means overlap. Cities for which plans are evaluated have similar rates of improvement in welfare as all cities from 1980 to 1990, but average metro Atlanta cities declined in welfare from 1990 to 2000 while those for which plans are evaluated did not. This difference does not require rejecting the cities for which plans are evaluated, but it does suggest that caution should be used in making statements about all metro Atlanta cities from the ones included here.

Eight of the seventeen cities with unsustainable development have plans which are evaluated in this research. They are: Lovejoy (in Clayton County); Lithonia (in DeKalb County); Franklin (in Heard County); Shady Dale (in Jasper County); Gay, Greenville, Luthersville, and Manchester (in Meriwether County); and Zebulon (in Pike County).

Table 34: Correlations with Population Characteristics

Variables	ΔGPI	GPI2000	White	Black	Asian	Income	PercentPov	PercentHS	PercentBS
ΔGPI	1.000								
GPI2000	0.039	1.000							
	(0.624)								
White	0.089	0.345	1.000						
	(0.264)	(0.000)							
Black	-0.136	-0.372	-0.946	1.000					
	(0.089)	(0.000)	(0.000)						
Asian	0.128	0.138	-0.284	0.013	1.000				
	(0.109)	(0.084)	(0.000)	(0.871)					
Income	0.063	0.496	0.333	-0.424	0.371	1.000			
	(0.430)	(0.000)	(0.000)	(0.000)	(0.000)				
PercentPov	-0.084	-0.439	-0.551	0.580	-0.107	-0.736	1.000		
	(0.293)	(0.000)	(0.000)	(0.000)	(0.179)	(0.000)			
PercentHS	0.093	0.517	0.128	-0.173	0.273	0.782	-0.600	1.000	
	(0.246)	(0.000)	(0.108)	(0.029)	(0.001)	(0.000)	(0.000)		
PercentBS	0.015	0.496	0.023	-0.114	0.401	0.702	-0.351	0.778	1.000
	(0.849)	(0.000)	(0.778)	(0.153)	(0.000)	(0.000)	(0.000)	(0.000)	

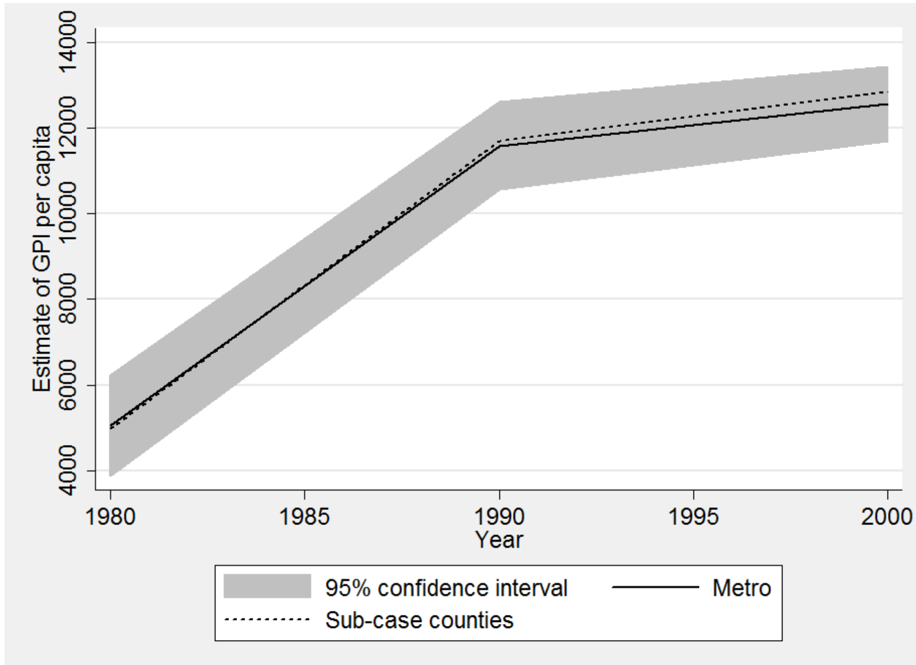

Figure 68: GPI per capita, for metro and sub-case counties

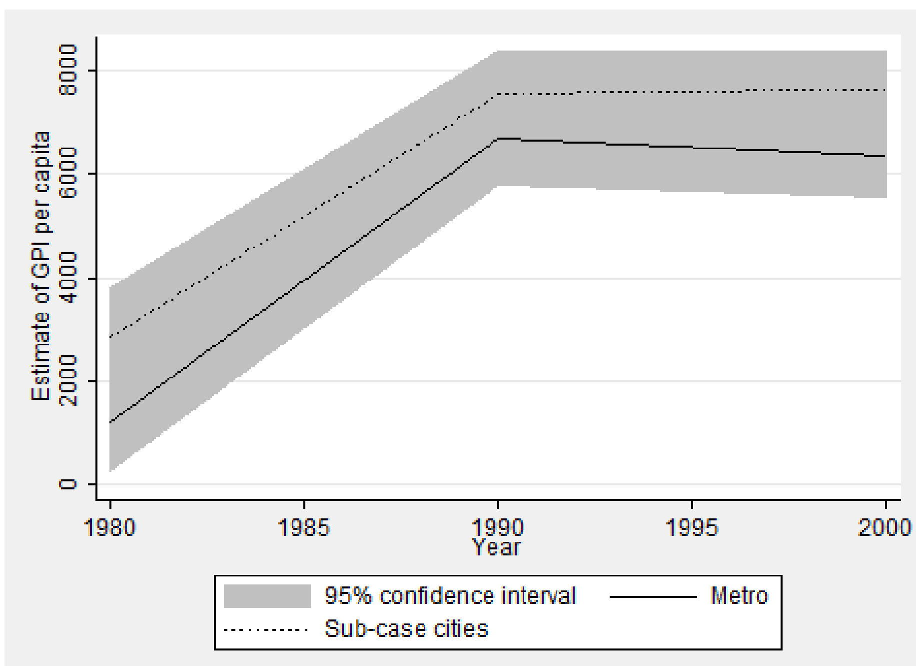

Figure 69: GPI per capita, for metro and sub-case cities

Table 35: Portion of metro Atlanta jurisdictions with sustainable development

	Economic	Social	Environment	Resources	GPI
Sustainable					
Counties	28	0	18	0	28
Cities	130	3	83	0	113
Unsustainable					
Counties	0	28	10	28	0
Cities	0	127	47	130	17
Portion Sustainable					
Counties	100%	0	64.3%	0	100%
Cities	100%	2.3%	63.8%	0	13.1%

6.1.6 Summary of development in metropolitan Atlanta

Development in metropolitan Atlanta is weakly sustainable. There are many ways to look at the data on development because of the improvements made to the methodology for this dissertation; development can be viewed by dimension, measure or in aggregations of different sections of the region. Breaking the metropolitan region down into RDCs and urban tiers show that development and welfare are varied across the region with the highest welfare in the northern parts of the suburban ring and the lowest welfare, but largest gains in relative welfare, occurring on the fringe of the metropolitan region.

Table 35 shows the count and portion of jurisdictions with sustainable development using the GPI measures. All jurisdictions have sustainable economic development, largely due to increased income over time. Because of the dominating role of the economic dimension in the overall GPI (recall Figure 49), all jurisdictions show sustainable development. However, this development is only weakly sustainable because the gains made in the economic dimension are offsetting unsustainable development in other dimensions. The three cities that show sustainable social development (Braswell, Sunny Side, and Talking Rock) also are among those cities with sustainable environmental development. When cities are looking for examples, then, of best practices; it may be beneficial to explore these three places. Note that for counties the resources dimension includes costs of converting forest, wetlands, and farmlands into other forms while these costs are excluded for cities; therefore, the decline in resource welfare in cities as well as counties suggests that man-made capital is not being maintained even as natural capital is depleted.

The possibility that measurement or specification error contributed to these results is a possibility and is discussed throughout the section. While characteristics of the jurisdiction and population were expected to be influential on development, only the rate of population growth was shown to be significant after outliers were removed.

The jurisdictions that make up the sub-cases of this study because they had plans evaluated in this study were shown to be representative in the methodology section, and development in these counties is consistent with average metro Atlanta development and welfare; however, the city sub-cases have higher welfare and different development from 1990 to 2000 than the average metro Atlanta city. These considerations should be kept in mind when interpreting results of the relationship between planning and development for cities.

6.2 Planning in Metropolitan Atlanta

Planning in metropolitan Atlanta is evaluated in this dissertation using content analysis as described in Section 5.4. Table36 shows final coding agreement by coded area. Coder agreement was just under 90% for the principle of sustainable development and over 90% for the plan quality. The κ scores suggest good intercoder reliability, meaning that the coding definitions were consistent. While this agreement is measured to determine the consistency of category coding, all disagreements were resolved between coders to result in final agreement on which code should be used for the analysis.

Planning in metropolitan Atlanta is evaluated here based on the coding described above for 36 unique plans. These plans represent 65 jurisdictions in metropolitan Atlanta. The representativeness of these places for metropolitan Atlanta has been discussed in Section 5.5 and discussed again based on results of the measure of development above. Table 37 summarizes the observed plans by county,

Table 36: Intercoder agreement

	SDP	Strong	Specific	Measurable
Agreement	89.8	95.37	93.47	96.13
Exp. Agreement	38.92	54.69	56.31	53.89
κ	0.8329	0.8979	0.8506	0.9161
Std. Err.	0.014	0.0195	0.0195	0.0195
z	72.96	46.12	43.71	47.05
Prob>z	0	0	0	0

showing the plan year, whether or not it was jointly developed with another jurisdiction, the total number of policy statements identified in the plan, the mean score for those policy statements, and the measured commitment of the plan text to sustainable development (percent of policy statements coded for a principle of sustainable development). Additional detailed data on plan evaluations can be found in Appendix C

Table 37: Summary of Plan Observations, by County

County	City	Year	Joint	Count of Statements	Mean Score	SDP Commitment
Barrow		1998	Yes	91	2.165	0.33
Barrow	Auburn	1998	Yes	91	2.165	0.33
Barrow	Bethlehem	1998	Yes	91	2.165	0.33
Barrow	Carl	1998	Yes	91	2.165	0.33
Barrow	Statham	1998	Yes	91	2.165	0.33
Barrow	Winder	1998	Yes	91	2.165	0.33
Butts		1987	No	60	2.417	0.467
Carroll		2008	No	155	2.903	0.523
Cherokee		2000	Yes	96	1.844	0.333
Cherokee	Ball Ground	2000	Yes	20	1.75	0.25
Cherokee	Waleska	2000	Yes	18	1.889	0.444
Clayton		2004	No	255	2.91	0.427
Clayton	Lovejoy	2004	No	65	2.908	0.354
Cobb		1990	No	129	2.093	0.326
Cobb	Acworth	2001	No	175	2.314	0.383
Cobb	Marietta	1997	No	96	2.031	0.406
Cobb	Powder Springs	1996	No	55	2.109	0.218
Cobb	Smyrna	1991	No	140	1.907	0.314

Continued on next page

Table 37 (continued)

County	City	Year	Joint	Count of Statements	Mean Score	SDP Commitment
Coweta		1995	No	159	1.862	0.352
Coweta	Moreland	2006	No	26	1.962	0.538
Dawson		2008	No	51	2.353	0.333
DeKalb	Decatur	2005	No	48	2.438	0.375
DeKalb	Lithonia	1995	No	74	2.041	0.297
Douglas		2004	No	100	2.7	0.6
Fayette	Fayetteville	1995	No	18	2.722	0.111
Forsyth		2004	No	41	2.683	0.805
Fulton		1990	No	90	2.144	0.7
Fulton	Fairburn	2006	No	56	1.321	0.518
Gwinnett		1997	No	50	2.14	0.4
Heard		1991	No	70	2.7	0.257
Heard	Centralhatchee	1991	Yes	31	2.29	0.258
Heard	Ephesus	1991	Yes	33	2.546	0.212
Heard	Franklin	1991	Yes	37	2.297	0.216
Jasper		1992	Yes	31	2.419	0.29
Jasper	Monticello	1992	Yes	31	2.419	0.29
Jasper	Shady Dale	1994	No	22	2.818	0.091
Lamar		2009	No	31	2.613	0.419
Meriwether		2008	Yes	42	2.286	0.524
Meriwether	Gay	2008	Yes	42	2.286	0.524
Meriwether	Greenville	2008	Yes	42	2.286	0.524
Meriwether	Lone Oak	2008	Yes	42	2.286	0.524
Meriwether	Luthersville	2008	Yes	42	2.286	0.524

Continued on next page

Table 37 (continued)

County	City	Year	Joint	Count of Statements	Mean Score	SDP Commitment
Meriwether	Manchester	2008	Yes	42	2.286	0.524
Meriwether	Warm Springs	2008	Yes	42	2.286	0.524
Meriwether	Woodbury	2008	Yes	42	2.286	0.524
Paulding		2007	Yes	55	3.164	0.473
Paulding	Braswell	2007	Yes	55	3.164	0.473
Paulding	Dallas	2007	Yes	55	3.164	0.473
Paulding	Hiram	2007	Yes	55	3.164	0.473
Pickens		1993	Yes	54	2.074	0.167
Pickens	Jasper	1993	Yes	54	2.074	0.167
Pickens	Nelson	1993	Yes	54	2.074	0.167
Pickens	Talking Rock	1993	Yes	54	2.074	0.167
Pike		1994	Yes	41	2.512	0.22
Pike	Concord	1994	Yes	41	2.512	0.22
Pike	Meansville	1994	Yes	41	2.512	0.22
Pike	Molena	1994	Yes	41	2.512	0.22
Pike	Williamson	1994	Yes	41	2.512	0.22
Pike	Zebulon	1994	Yes	41	2.512	0.22
Walton		2006	Yes	49	1.959	0.367
Walton	Good Hope	2006	Yes	49	1.959	0.367
Walton	Loganville	2006	Yes	49	1.959	0.367
Walton	Monroe	2006	Yes	49	1.959	0.367
Walton	Social Circle	2006	Yes	49	1.959	0.367
Walton	Walnut Grove	2006	Yes	49	1.959	0.367

Both the best quality plan (Paulding County) and the worst quality plan (Fairburn) are recent, from 2007 and 2006, respectively. These plans may (we hope) reflect the quality of earlier plans for these jurisdictions. The plans most and least committed to sustainable development are Forsyth County (2004) and Shady Dale (1994).

6.2.1 Plan quality in metropolitan Atlanta

Of 2564 policy statements, 541 (or 21%) were high quality statements scoring 4/4 points while 708 (or 28%) received no quality points - they were weakly worded, vague, and not measurable. The other 51% were some combination of one or two of the quality areas: strong, specific, or measurable. Recall that the minimum score for policy statements is one because consideration of the policy is not without value even if it does not result in a statement that is strong, measurable, and specific. Policy statements are most likely to be strong 1687/2564 statements using strong verbs. They are less likely to be measurable (913/2564) or specific (824/2564).

Table 38 highlights summary statistics for the plan quality scores. For the thirty-six coded plans, the average number of statements per plan was 71 with the shortest having only eighteen policy statements and the longest including 255. The range of total plan quality scores is from 1.32 to 3.16 with a mean of 2.31. Figure 70 shows the distribution of mean quality scores over plans. Note: the mean score for policy statements, not by plan, is 2.34 with a standard deviation of 1.09. The difference can be partially considered by noting the great variety of distributions of policy statement quality across plans as shown in Figure 71. More detail on individual plan scoring can be found in Appendix C. While it might be expected that the number of policy statements might be related to the plan score, this is not supported by a correlation.

Table 38: Summary statistics for plan quality, by plan

Variable	Mean	(Std. Dev.)	Min.	Max.
score	2.31	(0.399)	1.32	3.16
statements	71.22	(52.42)	18	255
N		36		

While the plan quality evaluation method presented in this dissertation yields a richer level of detail than the previous method of identifying merely the strength of statements of a particular issue, it does not find plans to be of significantly higher or lower quality. Berke and Godschalk (2009) reported standardized policy plan quality scores (on a scale of 0 to 1) based on previous

Figure 70: Mean Scores for Whole Plans

studies with a mean of 0.25 and a standard deviation of .24. The present method's scores can be converted to compare with previous studies by subtracting the point added for policies existing then dividing by the max score of 3 to have a range of 0-1). After standardizing, the mean here is 0.329 with a standard deviation of 0.3 which falls within the range of the mean for previous studies. This comparability provides some support for the validity of the plan quality evaluation method presented in this dissertation.

6.2.1.1 Plan quality by RDC

Considering plans by Regional Development Center, there there is little difference between the mean scores for plans within each area. Table 39 shows the distribution of coded plans and their mean scores by Regional Development Center; as might be expected, the bulk of coded plans were in the Atlanta Regional Commission.[4] While this section focuses on the 36 unique plans, rather than the 65 jurisdictions they represent, the difference in mean plan quality score is given to show that the means are not grossly affected by the additional observations. The highest scoring region was Coosa Valley, and the lowest was the Atlanta Regional Commission. This could be an artifact of having

[4]Refer to Tables 6 and 7 to see the list of counties and cities in each center.

Figure 71: Policy Scores Within Plans

more plans coded in the Atlanta Regional Commission.

Table 39: Coded plans and mean scores by RDC

RDC	N	Unique N	mean	Unique mean
North Georgia	4	1	2.074	
Coosa Valley	4	1	3.164	
Atlanta Regional	17	17	2.192	
Georgia Mtns	2	2	2.518	
Northeast Georgia	15	4	2.160	2.34
McIntosh Trail	8	3	2.513	
Chattahoochee Flint	15	8	2.323	2.356
Total	65	36	2.317	2.313

6.2.1.2 *Plan quality by urban tier*

The most striking thing about Table 40 is that all of the joint plans where no unique policy sections are set up for cities within the county are in the fringe. However, multiple counting of these joint plans only reduces the mean score of fringe policies by 0.05, which is within the confidence interval for the mean. There is no significant correlation between tier and mean plan quality score.

Table 40: Coded plans and mean scores by tier

tier	N	Unique N	mean	Unique mean
Core	6	6	2.294	
Suburban Ring	12	12	2.182	
Fringe	47	18	2.354	2.408
Total	65	36	2.317	2.313

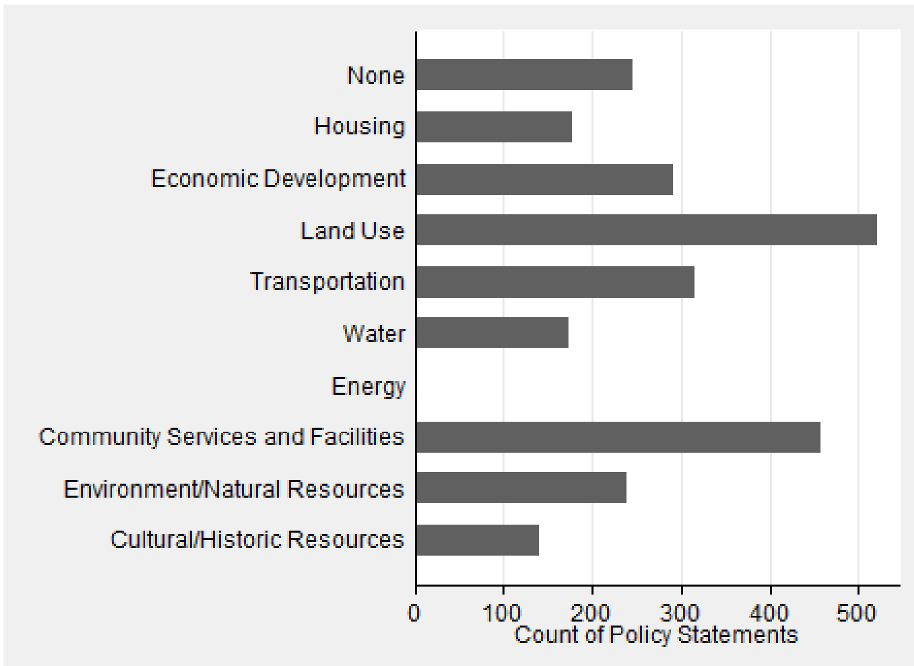

Figure 72: Policy Statements by Issue Area

6.2.1.3 Plan quality by issue area

Figure 72 shows the distribution of policy statements by issue area. The bulk of policy statements are about either land use (521/2564) or Community Facilities and Services (457/2564) while almost one-tenth (245/2564) didn't fit into any of the nine issue areas; only one policy statement was about energy. Those that didn't fit into coded areas were often about the business of planning, community aesthetics, or too broad to classify.

The number of policy statements by issue area in Table 41 represents the same as Figure 72, above; the score mean represents the average total score for all policy statements that are categorized for that issue area. The highest average score is for the environment/natural resources issue area while the lowest is for energy. Energy policy statements included one statement to encourage energy efficient materials and two regarding coordinating on a program to help pay for energy services for low-income individuals.

Table 41: Plan Policy Quality Results

Issue area	N	Strong	Measurable	Specific	Score Mean
None	245	155	72	49	2.1265
Housing	177	87	55	51	2.0904
Economic Development	291	161	70	64	2.0137
Land Use	521	333	171	165	2.2841
Transportation	316	217	108	85	2.2975
Water	173	126	72	65	2.5202
Energy	3	0	0	0	1
Community Services and Facilities	457	337	185	190	2.558
Environment/Natural Resources	239	175	117	101	2.6444
Cultural/Historic Resources	142	96	63	54	2.5

6.2.2 Commitment to sustainable development in metropolitan Atlanta plans

Figure 73 shows that more than half of the coded policy statements are not based on principles of sustainable development. Among plans, the average commitment to sustainable development is 36.9% with a minumum of 9% and a maximum of 80%. This means that all plans included some statements based on these six principles of sustainable development. However, it is important to remember that much of the business of government is not directly related to these six principles of sustainable development: Jails must be operated, business must be encouraged (whatever that means), commercial buildings must conform to sign guidelines, etc. Even more interesting might be the lack of use of the polluter pays principle. In 2564 policy statements, only two build on the principle of polluter pays. This is not to say that local jurisdictions in metro Atlanta don't use fees or other sticks to encourage good environmental stewardship, but it does indicate that such methods are not included in long-range plans. This is another case where the black box of implementation could be helpful to open up.

6.2.2.1 Plan commitment to sustainable development principles by RDC

The range for the percent of statements coded for sustainable development principle by Regional Development Center goes from a high of 57% in Georgia Mountains to a low of 17% in North Georgia. Table 42 gives the average percent for all regions.

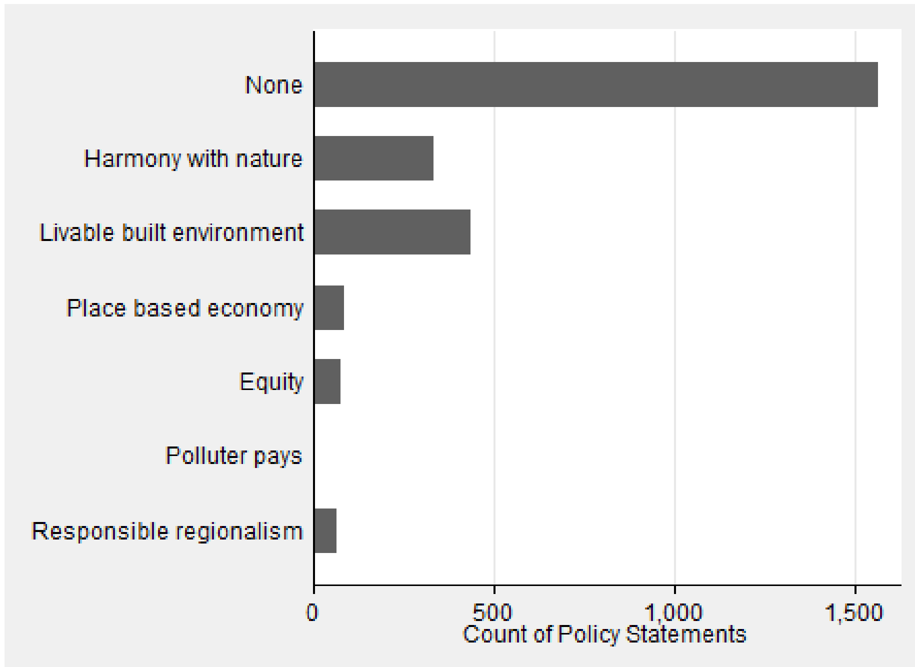

Figure 73: Policy Statements by Sustainable Development Principle

Table 42: Percent of statements coded for SDP, by RDC

RDC	N	mean
North Georgia	1	.167
Coosa Valley	1	.473
Atlanta Regional	17	.380
Georgia Mountains	2	.570
Northeast Georgia	4	.270
McIntosh Trail	3	.369
Chattahoochee Flint	8	.360
Total	36	.370

6.2.2.2 Plan commitment to sustainable development principles by urban tier

The most committed plans are found in the urban core, and the least, on average, are found in the fringe of metropolitan Atlanta (see Table 43).

Table 43: Percent of statements coded for SDP, by tier

tier	N	mean
Core	6	.445
Suburban Ring	12	.383
Fringe	18	.335
Total	36	.370

6.2.3 Commitment to sustainable development by issue area

Breaking down the issue areas by sustainable development principle, as in Figure 74, shows that each issue area has some statements not based on principles of sustainable development, especially community services and facilities. This can be expected because most of the business of government does not rely on these principles of sustainable development; while it would be absurd to suggest that places should not maintain adequate police and fire protection or provide for eduction of children, such policies lie outside the realm of sustainable development as defined by these six principles. Issue areas of natural resources and water are most likely to be coded for a principle of sustainable development - “harmony with nature.” For the natural resources issue area, the majority of policy statements were about preserving and protecting natural resources from pollution and encroaching development. For the water issue area, policy statements coded for “harmony with nature” were about keeping water resources clean or conserving water. Cultural and historic resource policy statements were almost always about preservation and placement of such resources on national or state registers of historic places; however, statements about relying on historic and cultural resources for the purposes of tourism are primarily about capitalizing on local resources for economic development in keeping with the principle of a “place based economy.” Housing statements that were coded for a sustainable development principle were usually about equal access to housing, “equity,” or about maintenance or safety of housing, “livable built environment.”

Figure 74: Sustainable Development Principle by Issue Area

6.2.4 Relationship between plan quality and commitment to sustainable development in metropolitan Atlanta plans

Policy statements coded for a sustainable development principle have higher scores, on average, than those not coded for a sustainable development principle. Table 44 shows the underlying data for a hypothesis test that the mean score is the same (or difference=0) for these two groups of policy statements. The p-value for the test statistic under the hypothesis that the mean of the scores for No SDP and SDP coded policy statements is 0.0112, suggesting that the probability that the value of the test statistic (-2.5387) would be observed about 1.1 percent of the time. This result suggests that policy statements based on principles of sustainable development are more likely to have higher quality scores.

Table 44: Scores for Policy Statements Coded for Sustainable Development Principles and Not

	Obs	Mean	Std. Err.	(Std. Dev.)	95% Conf. Interval	
SDP	1003	2.40	0.035	(1.118)	2.334	2.473
No SDP	1561	2.29	0.027	(1.077)	2.238	2.345
combined	2564	2.34	0.022	(1.094)	2.293	2.378
diff		-0.112	0.044		-0.199	-0.026

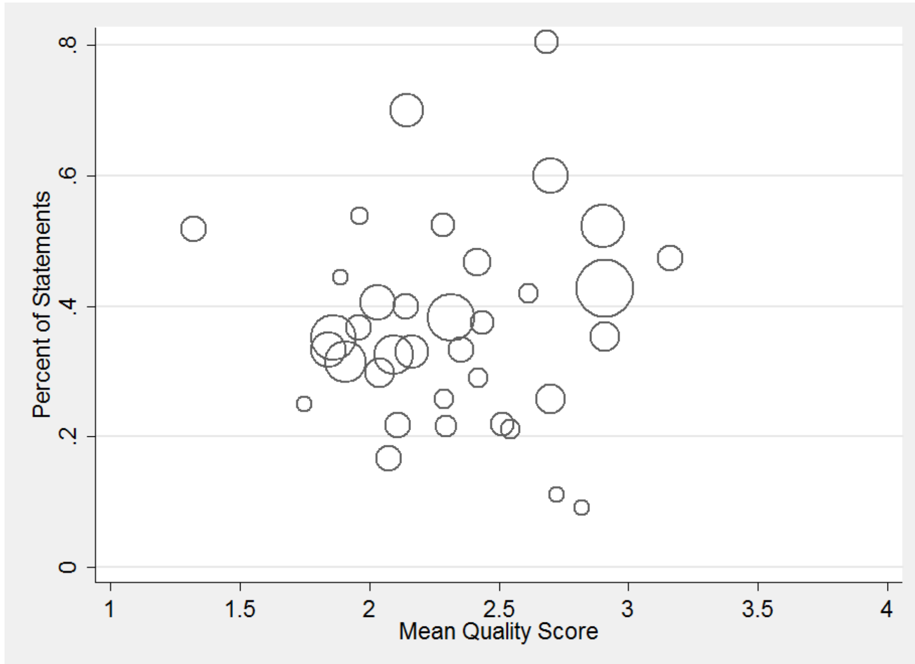

Figure 75: Plan quality score and commitment to sustainable development

When whole plans, rather than individual policy statements are observed, the relationship between plan quality and commitment to sustainable development appears insignificant. Figure 75 shows the relationship between overall plan quality and commitment to sustainable development, with the markers weighted for the number of statements in each plan.

However, looking at the relationship between quality and commitment to sustainable development by dimension, a pattern can be seen in the environment dimension (green circles on Figure 76). The environment dimension is the only significant relationship, with a correlation coefficient of 0.4884, significant at 1%.

Across dimensions, the environment dimension's quality score is significantly and positively related to the commitment to sustainable development in the resources dimension with a correlation coefficient of 0.2800, significant at 10%, and the resources dimension's quality score is signficantly and positively correlated to the commitment to sustainable development in the economic dimension with a coefficient of 0.3220, significant at 10%. These weakly significant relationships may indicate that places with strong commitment to sustainable development may craft policy statements that consider the impact on others. Environmental policies may be strong, specific, and measurable because of an underlying commitment to natural resource protection; or economic development

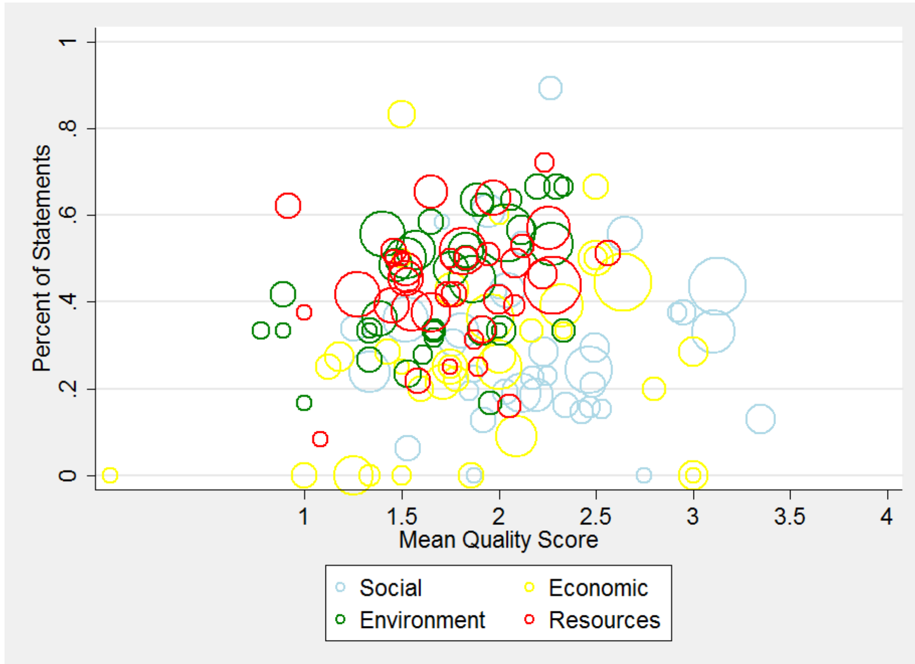

Figure 76: Sustainable Development Principle by Issue Area

policies may be worded with regard to their impact on sustainable development principles because of an underlying commitment to natural resource protection, shown by strong statements in the resources dimension.

Identifying the skewness of the portion of statements in each plan by issue area illustrates the myopic or holistic commitment to sustainable development. Berke and Conroy (2000) found that most plans did present a myopic view, and evidence of the same is found here. Most policy statements are concentrated in two issue areas: land-use and community facilities and services. When this skewness is related to the overall commitment to sustainable development, the relationship is positive and significant at 5% meaning that as the commitment becomes more myopic or focused on any one area, the overall percent of statements that are scored for sustainable development increases. In addition, there is a weak but significant positive correlation with plan quality score, suggesting that a more myopic view is correlated with stronger, specific, measurable statements. This finding is consistent with Berke and Conroy (2000).

6.2.5 Discussion of planning and theoretical arguments

In the theoretical framework, Section 4, planning characteristics are assumed to have an influence on plan texts. A correlation between plan content analysis results and the two variables of information available for planning characteristics, plan year and whether or not it was joint, is presented in Table 45. The commitment to sustainable development (percent of statements coded for a principle of sustainable development) is positively and significantly related to the year of the plan. This is likely because newer plans would be based on greater planning capacity, for which data were not available here, and on changing planning requirements from the state of Georgia; newer language is more focused on sustainable development in state planning guidelines.

Table 45: Cross-correlation table for planning characteristics

Variables	Score	Commitment	Year	Joint
Score	1.000			
Commitment	0.086	1.000		
	(0.494)			
Year	0.120	0.616	1.000	
	(0.342)	(0.000)		
Joint	-0.070	-0.186	0.089	1.000
	(0.581)	(0.138)	(0.481)	

6.2.6 Summary of planning in metropolitan Atlanta

Plans in metropolitan Atlanta vary in size, quality, and commitment to sustainable development. Most plans are focused on land use and community facilities and services; this is expected because long-range planning requires consideration of what development will occur where and how the jurisdiction will provide for its citizens.

The highest scoring policy statements were for the environment and natural resources issue area, implying that policies to deal with environment and natural resource concerns were most like to to be strong, specific, and measurable. While it consisted of few statements, the lowest scoring policy statements were for the energy issue area; jurisdictions did not include their plans for providing energy services to citizens in plans. It is possible that this issue is handled in a separate forum than long-range comprehensive planning.

On average, about 37% of statements in a plan showed commitment to sustainable development principles; commitment was significantly related to the year of the plan, with newer plans showing higher commitment. All plans included some statements related to sustainable development principles.

Individual policy statements were significantly more likely to score high in plan quality if they were also committed to sustainable development principles. However, plans with higher average policy quality scores were not significantly more likely to have higher commitment to sustainable development; this holds within dimensions as well, except for the environment dimension which has a significant relationship between quality and commitment.

6.3 Relating plans and development

This section gets to the heart of the research question of this dissertation. How does comprehensive planning relate to sustainable development? To express the results as they relate to this question, this section is organized as follows. First, summary statistics for development and plans for those jurisdictions with plans is presented. Second, results of the analysis of the relationship between plan quality and development are given. Then, results of the analysis of the relationship between plan commitment to sustainable development and development are given.

6.3.1 Summary statistics

An analysis of the From the plans evaluated, there are 65 jurisdictions with observed plans. This is from 36 unique sets of policy statements. The greater number is due to several cities and counties completing joint plans without having separate policy statements. Therefore, the county and cities with joint plans and a single set of policy statements will have separate observations because each jurisdiction has its own development and characteristics.

Although there are 65 plans observed, only 33 of these observations occur before 2000, the end point of the GPI data available at this time. Because of this limitation, calculations for how plans relate to welfare and development will consider those completed before 2000 as a separate analysis from all plans. Table 46 shows means and standard deviations for the change in welfare, plan quality score, and commitment to sustainable development for all plans and for just those completed before 2000. Note: the change in welfare ΔGPI is not significantly related to the year of the plan.

Table 46: Mean development, plan quality, and commitment to sustainable development, by dimension

Dimension	ΔGPI[1]	Plan Quality	Percent Sust
All plans (65 obs)			
social	-1.388	2.216	0.293
	(0.943)	(0.424)	(0.171)
economic	0.569	2.005	0.276
	(0.232)	(0.551)	(0.194)
environment	0.028	1.75	0.427
	(0.44)	(0.379)	(0.163)
resources	-0.28	1.782	0.421
	(0.042)	(0.35)	(0.137)
overall			
Only plans completed before 2000 (33 obs)			
social	-1.322	2.163	0.226
	(0.746)	(0.342)	(0.115)
economic	0.586	1.946	0.203
	(0.226)	(0.665)	(0.2)
environment	0.01	1.644	0.367
	(0.383)	(0.276)	(0.154)
resources	-0.283	1.721	0.346
	(0.05)	(0.26)	(0.146)
overall			

(standard deviation)

1.ΔGPI is change from 1980 to 2000, relative to 1980 $(GPI1980) * (1 + \Delta GPI) = GPI2000$

6.3.2 Plan quality and development

Hypothesis one put forth based on the theoretical framework of this dissertation is that high quality planning would be related to improvements in welfare, or sustainable development. Combining the measures of development with those of plan quality allows this assessment for overall welfare as well as along each dimension of sustainable development.

Table 47 shows the correlations between changes in welfare and plan quality for all 65 jurisdictions. Although there are some significant relationships within scoring and within development, most of the plan quality vs. development relationships are insignificant. The only significant relationships between scores and development were the score for the economic dimension (which is only the economic development issue area of the plans) on the development of environmental welfare and resource welfare; these relationship is negative and significant at 5% and 10%, respectively. It is possible that a place with higher economic development issue area scores might be focused more on attracting industry than improving environmental or resource welfare. Or, economic development in a place might depend upon converting natural resources for economic gain, such as converting forestland into hypothetical shopping complexes. While forestland is included in this study, the value of shopping complexes is not; this, of course, is just one potential explanation.

The results are more significant when the correlations are focused on the 33 jurisdictions with plans from before 2000 (See Table 48). The quality of economic development policy statements is again negatively and significantly (both at 5%) related to environment and resource dimension development. The overall plan quality score is negatively and significantly related to overall development and development of economic welfare at 5%. In addition, the quality of policy statements from the social dimension is negatively and significantly related to overall development as well as development of environment and resource dimensions (at 1%, 1%,and 5%). Scores for the quality of policy statements in the environment dimension are negatively and significantly related to overall development as well as development of economic and environment dimensions (at 5%, 1%,and 5%). Last, but not least, the quality of policy statements in the resources dimension are negatively and significnatly related to development overall and on all dimensions except social.

Table 47: Cross-correlation table for ΔGPI & plan score

			Δ GPI					Plan Quality Score		
Variables	Overall	Econ	Social	Env	Rsrc	Mean	Econ	Social	Env	Rsrc
	A	B	C	D	E	F	G	H	I	J
A	1.000									
B	0.359	1.000								
	(0.003)									
C	0.085	0.152	1.000							
	(0.499)	(0.228)								
D	0.423	0.268	-0.065	1.000						
	(0.000)	(0.031)	(0.607)							
E	0.130	0.154	-0.246	0.325	1.000					
	(0.302)	(0.222)	(0.048)	(0.008)						
F	-0.161	-0.092	-0.011	-0.106	-0.149	1.000				
	(0.200)	(0.465)	(0.930)	(0.399)	(0.235)					
G	-0.162	-0.184	0.009	-0.284	-0.222	0.492	1.000			
	(0.199)	(0.143)	(0.943)	(0.022)	(0.075)	(0.000)				
H	-0.164	-0.185	-0.075	-0.019	-0.135	0.798	0.457	1.000		
	(0.190)	(0.139)	(0.552)	(0.878)	(0.284)	(0.000)	(0.000)			
I	0.102	-0.055	0.010	-0.054	-0.104	0.562	0.404	0.499	1.000	
	(0.421)	(0.663)	(0.939)	(0.672)	(0.409)	(0.000)	(0.001)	(0.000)		
J	-0.141	-0.180	0.035	-0.186	-0.179	0.853	0.567	0.684	0.708	1.000
	(0.261)	(0.151)	(0.780)	(0.138)	(0.153)	(0.000)	(0.000)	(0.000)	(0.000)	

Table 48: Cross-correlation table for ΔGPI & plan score, before 2000

			Δ GPI				Plan Quality Score			
Variables	Overall	Econ	Social	Env	Rsrc	Mean	Econ	Social	Env	Rsrc
	A	B	C	D	E	F	G	H	I	J
A	1.000									
B	0.396	1.000								
	(0.023)									
C	0.139	0.117	1.000							
	(0.442)	(0.518)								
D	0.582	0.119	-0.027	1.000						
	(0.000)	(0.509)	(0.880)							
E	0.185	0.154	-0.319	0.316	1.000					
	(0.304)	(0.392)	(0.070)	(0.073)						
F	-0.344	-0.348	-0.213	-0.278	-0.324	1.000				
	(0.050)	(0.047)	(0.235)	(0.117)	(0.066)					
G	-0.265	-0.233	0.185	-0.512	-0.348	0.343	1.000			
	(0.136)	(0.192)	(0.303)	(0.002)	(0.047)	(0.051)				
H	-0.461	-0.474	-0.143	-0.194	-0.394	0.525	0.241	1.000		
	(0.007)	(0.005)	(0.426)	(0.278)	(0.023)	(0.002)	(0.177)			
I	-0.383	-0.553	-0.021	-0.351	-0.200	0.470	0.610	0.439	1.000	
	(0.028)	(0.001)	(0.906)	(0.045)	(0.264)	(0.006)	(0.000)	(0.011)		
J	-0.287	-0.504	0.005	-0.423	-0.312	0.480	0.535	0.334	0.823	1.000
	(0.105)	(0.003)	(0.976)	(0.014)	(0.077)	(0.005)	(0.001)	(0.057)	(0.000)	

This result consistently shows a significant negative relationship between plan quality and development, except for social welfare which was not related to any measure of plan quality. One possible explanation is that plans with policy statements that were more measurable, specific, and strongly worded were reactionary - intended to correct something that had already been identified as a problem. Or, perhaps, these higher quality policy statements are focused on things that may be important at the time to the jurisdiction, such as ensuring adequate library or fire department facilities, that are not adequately reflected in the measures of welfare. Perhaps also, the plans which were more visionary and less focused actually resulted in better implementation, for whatever reason.

The lack of relationship with the social dimension of welfare might be due to the private nature of this measure; social welfare was based on divorce, crime, leisure time, and time and safety of driving. These goods are surely influenced to some degree by the ability of a place to provide police and fire protection and safe roadways, and likely to smaller degree on the availability of cultural resources. However, the influence of local government policies on the divorce rate and leisure time is harder to connect; both of these are based on private contracts (except for government employees, whose leisure time might be determined by the jurisdiction). Certainly, individuals (not government plan writers) are making the choice to work somewhere and live in a place, probably with some consideration of potential for crime and time of commuting; and these same individuals are choosing whether or not to divorce.

Perhaps there is a difference generally between places that showed sustainable development and non-sustainable development. Using a t-test, it was determined that those places which had declining welfare did not have significantly different quality plans than other places; this result held even if looking only at cities (because no counties showed declining overall welfare). The lack of a significant difference might suggest that those places with unsustainable development have systemic problems not addressed by the form of planning that is undertaken in Georgia. Or, they may not be so badly off as it seems, just have many commuters.

A logit analysis on whether or not GPI was improving for the 45 cities with plans on jurisdictional characteristics (population, population growth rate, and the percent of workers who live and work in the same place), shows that the percent of workers living in the same place is negative and significant (see Table 49). This means that places with a higher percentage of workers from the same place where they live are less likely to have improving GPI; one interpretation of this is that those people living in the place where they work are lower income on average than those who commute to that place to work.

Table 49: Estimation results : logit for GPI better?

Variable	Coefficient	(Std. Err.)
Mean Score	-1.015	(1.196)
Population	0.000	(0.000)
Pop growth	-0.268	(0.203)
Live & Work	-5.589†	(3.218)
Intercept	4.221	(3.022)

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%

6.3.3 Plan commitment to sustainable development and development

Based on the theory that sustainable development included in plans would lead to better outcomes, the hypothesis was that a jurisdiction would have improved welfare over time if long-range planning was committed to principles of sustainable development. Table 50 shows that the expected direction is in place for the 65 jurisdictions evaluate; higher percentage of statements coded for principles of sustainable development is correlated to more sustainable development. However, only three of these positive relationships are (weakly) significant: The commitment to sustainable development principles in the economic dimension on social welfare development and the commitment to sustainable development principles in the environment dimension on environmental welfare development and overall development. This suggests that there may be weak support for the hypothesis that commitment to sustainable development in plans leads to better welfare.

Unlike when looking at the plan quality scores, focusing on plans before the year 2000 does not increase significance of relationships. It does change the relationships; see Table 51. For plans before 2000, the overall commitment to sustainable development as well as that in the environment and resources portion of the plan are positively and significantly related to more sustainable environmental welfare. This could suggest that the hypothesis is partially true, with principles of sustainable development guiding policies to improve environmental welfare. Or it might reflect that policies dealing with environmental welfare are naturally constructed in the style of the principles of sustainable development, such as harmony with nature.

Table 50: Cross-correlation table for ΔGPI & plan commitment to SD

			Δ GPI					Commitment to SD		
Variables	Overall	Econ	Social	Env	Rsrc	All	Econ	Social	Env	Rsrc
	M	N	O	P	Q	R	S	T	U	V
M	1.000									
N	0.359	1.000								
	(0.003)									
O	0.085	0.152	1.000							
	(0.499)	(0.228)								
P	0.423	0.268	-0.065	1.000						
	(0.000)	(0.031)	(0.607)							
Q	0.130	0.154	-0.246	0.325	1.000					
	(0.302)	(0.222)	(0.048)	(0.008)						
R	-0.029	0.004	0.027	0.021	0.146	1.000				
	(0.820)	(0.972)	(0.829)	(0.871)	(0.245)					
S	-0.018	-0.043	0.217	0.064	-0.162	0.617	1.000			
	(0.888)	(0.733)	(0.083)	(0.610)	(0.198)	(0.000)				
T	-0.175	-0.095	0.066	-0.183	-0.037	0.770	0.538	1.000		
	(0.164)	(0.450)	(0.602)	(0.145)	(0.769)	(0.000)	(0.000)			
U	0.232	0.197	0.139	0.293	0.130	0.423	0.304	0.040	1.000	
	(0.063)	(0.115)	(0.269)	(0.018)	(0.304)	(0.000)	(0.014)	(0.751)		
V	0.018	-0.069	0.012	0.188	-0.009	0.767	0.552	0.447	0.657	1.000
	(0.885)	(0.585)	(0.924)	(0.133)	(0.941)	(0.000)	(0.000)	(0.000)	(0.000)	

Table 51: Cross-correlation table for ΔGPI & plan commitment to SD, before 2000

			Δ GPI					Commitment to SD		
Variables	Overall	Econ	Social	Env	Rsrc	All	Econ	Social	Env	Rsrc
	M	N	O	P	Q	R	S	T	U	V
M	1.000									
N	0.396	1.000								
	(0.023)									
O	0.139	0.117	1.000							
	(0.442)	(0.518)								
P	0.582	0.119	-0.027	1.000						
	(0.000)	(0.509)	(0.880)							
Q	0.185	0.154	-0.319	0.316	1.000					
	(0.304)	(0.392)	(0.070)	(0.073)						
R	0.114	0.180	0.160	0.329	0.263	1.000				
	(0.529)	(0.317)	(0.375)	(0.062)	(0.139)					
S	0.093	-0.088	0.209	0.228	-0.252	0.558	1.000			
	(0.606)	(0.625)	(0.244)	(0.202)	(0.156)	(0.001)				
T	-0.004	0.040	0.223	0.040	-0.093	0.736	0.576	1.000		
	(0.981)	(0.825)	(0.212)	(0.825)	(0.607)	(0.000)	(0.000)			
U	0.037	0.051	0.044	0.353	0.166	0.590	0.043	0.270	1.000	
	(0.836)	(0.778)	(0.810)	(0.044)	(0.357)	(0.000)	(0.811)	(0.128)		
V	0.145	0.010	0.073	0.468	0.033	0.740	0.450	0.469	0.853	1.000
	(0.422)	(0.958)	(0.687)	(0.006)	(0.854)	(0.000)	(0.009)	(0.006)	(0.000)	

6.3.4 Overall plans and development

Table 52: Regression models including important context variables

VARIABLES	(1) Econ	(2) Social	(3) Env	(4) Rsrc	(5) Overall
Population	9.71e-08		-5.00e-07**	1.21e-07***	
	(2.25e-07)		(2.41e-07)	(3.66e-08)	
Pop Grow		-0.152**	0.0441		
		(0.0721)	(0.0468)		
Live & Work				-0.0856*	
				(0.0430)	
HH Inc	0.157***		0.112*		
	(0.0408)		(0.0565)		
Percent Pov	-0.954**				
	(0.455)				
Percent HS	-0.722**				
	(0.348)				
Year	-8.04e-05	-0.0125	-0.0121	0.00201	0.125
	(0.00240)	(0.0178)	(0.0103)	(0.00142)	(0.106)
Joint				-0.00998	-0.598
				(0.00962)	(0.743)
PQ Econ	-0.0321				
	(0.0412)				
CSD Econ	-0.000358				
	(0.111)				
PQ Social		-0.105			
		(0.262)			
CSD Social		0.0845			
		(0.639)			
PQ Env			-0.0880		
			(0.0852)		
CSD Env			0.742***		
			(0.268)		
PQ Rsrc				-0.0178*	
				(0.0104)	
CSD Rsrc				-0.0812	
				(0.0673)	
PQ					-1.797
					(1.364)
CSD					-4.344
					(3.588)
Constant	0.759	23.97	23.44	-4.226	-242.7
	(4.820)	(35.60)	(20.44)	(2.829)	(208.9)

Continued on next page

Table 53: Significant relationships in combined regressions

	Jurisdiction			Population			Plan Eval.	
	Pop	Pop Grow	Live &Work	Median HH Inc	Poverty	High School	Quality	CSD
All								
Economic				+(1)	-(5)	-(5)		
Social		-(5)						
Environment	-(5)			+(10)				+(1)
Resources	+(1)		-(10)				-(10)	

Table 52 (continued)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Econ	Social	Env	Rsrc	Overall
Observations	65	65	65	65	65
R^2	0.599	0.110	0.309	0.287	0.055

Models are for 4 dimensions of development and overall
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

It is easier to see the important variables and their relationships if they are pulled out of this table into another format. Table 53 shows just the direction and level of confidence where variables remain significant in each dimension.

For the economic dimension, the population characteristics, representing socioeconomic conditions, explain most of the variation in development. Both the environment and resources dimensions show some dependence on jurisdiction and population characteristics along with plans. For the environment dimension, the commitment to sustainable development in plans is positively and significantly related to development even after controlling for important contextual variables, suggesting that places with a strong focus on environmental sustainability are able to lower the costs of dealing with pollution. In addition, development in the resources dimension is negatively related to plan quality; this suggests that places with a more rigid planning style (leaving less discretion to implementers) are also seeing faster increases in the costs of natural and man-made resource decline. While the social dimension regression results suggest that these contextual variables and plans are not related to changes in welfare, it may also reflect the limitations of the measure of social welfare - limited mostly to things not affected by local planning, such as family life and leisure time.

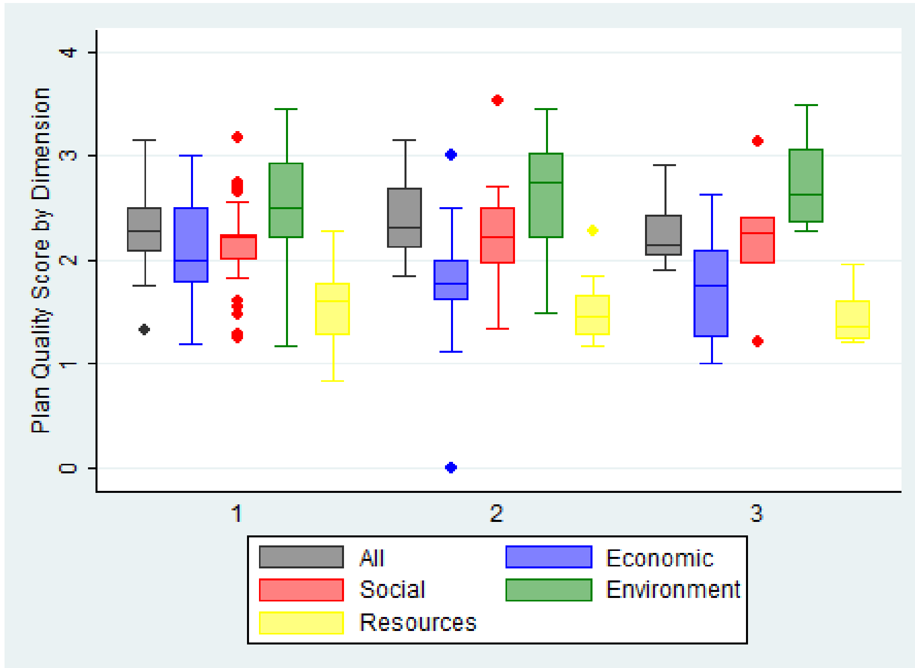

Figure 77: Distributions of plan quality scores, by cluster and dimension

6.3.5 Planning and development findings by growth pattern clusters

Recall from Section 5.1.3 that places were clustered to provide the ability to examine these results by development patterns that resembled those found in the three tiers of metropolitan Atlanta: the core, suburban ring, and urban fringe.

6.3.5.1 Planning by growth pattern clusters

Figure 77 shows that the distribution of plan quality scores is similar across clusters of development patterns. There are two exceptions: 1) The low population-moderate growth cluster (1) shows a dense concentration of social dimension plan quality scores and then many outliers, suggesting that policies for social issues are quite different in tone across these places; 2) The high population-low growth cluster (3) shows less variation than the others in environment, social, and overall scores, suggesting that places with high populations and low growth, such as found in the dense urban core, tend to be consistently high quality in their environmental policies - potentially due to previous environmental degradation or high pollution levels associated with urban traffic and industry.

With commitment to sustainable development in plans, the big difference is found with the moderate population-high growth cluster (2) where the range of plan commitment to sustainable

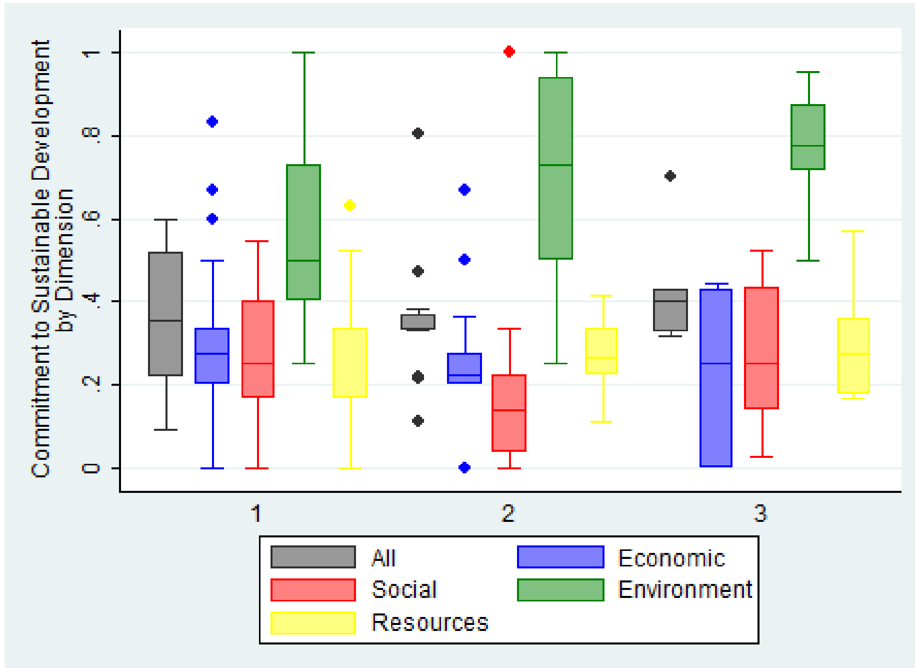

Figure 78: Distributions of plan commitment to sustainable development, by cluster and dimension

development is lower for all dimensions except environment than the other clusters (see Figure 78). Perhaps these places dealing with fast population growth are more focused on the immediate problems brought on by a rapidly changing population base than they are on principles of sustainable development.

6.3.5.2 Development by growth pattern clusters

A few outliers for overall change in welfare and change in social welfare make it difficult to observe the average changes in welfare. Figure 79 shows development by dimension by growth pattern cluster with the outliers of Hiram, Warm Springs, Loganville, Lovejoy, and Marietta highlighted. Note that these outliers are such because of a combination of factors; Loganville had both increasing income and population, suggesting that new residents moving to Loganville were wealthier than the existing population - this could be due to more commuters treating Loganville as a bedroom community. When these outliers are removed, it is clear that only in the low population-moderate growth cluster (1) is there any social welfare improvement (see Figure **??**. Also, the range of overall welfare change is greatest for the moderate population-high growth cluster (2), potentially reflecting a shifting in populations with high income and low income groups settling in different pockets across

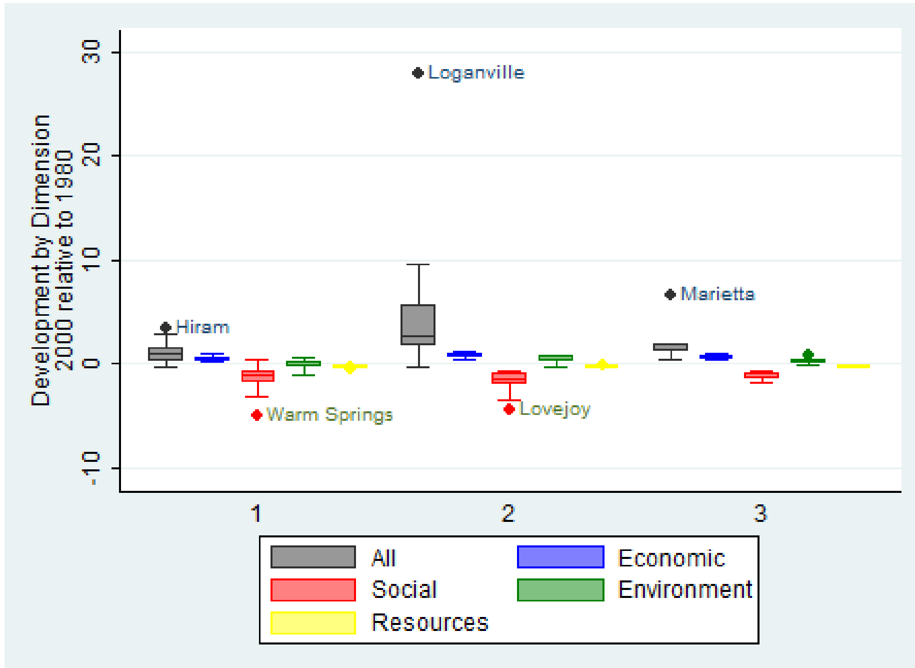

Figure 79: Distributions of development as relative change in GPI, by cluster and dimension

the metropolitan region. Only in the high population-slow growth cluster (3) do all places appear to be developing at least weakly sustainably; this may reflect their more advanced state of development - major resource decline and environmental costs may have already reached a peak while economic welfare is still improving.

6.3.5.3 Planning to development by growth pattern clusters

Regression analysis conducted on plans and development with places clustered into these three groups finds the same general pattern as above with two exceptions: population is no longer a significant contribution to development and the socioeconomic variables found to be significant in the economic dimension above are no longer significant. However, the overall findings hold that plan quality score is significant and negative for the environment dimension and the plan commitment to sustainable development is significant and positive for the resources dimension after controlling for contextual variables. Table 54 shows the coefficients for models specific to each dimension, including the context variables that mattered individually.

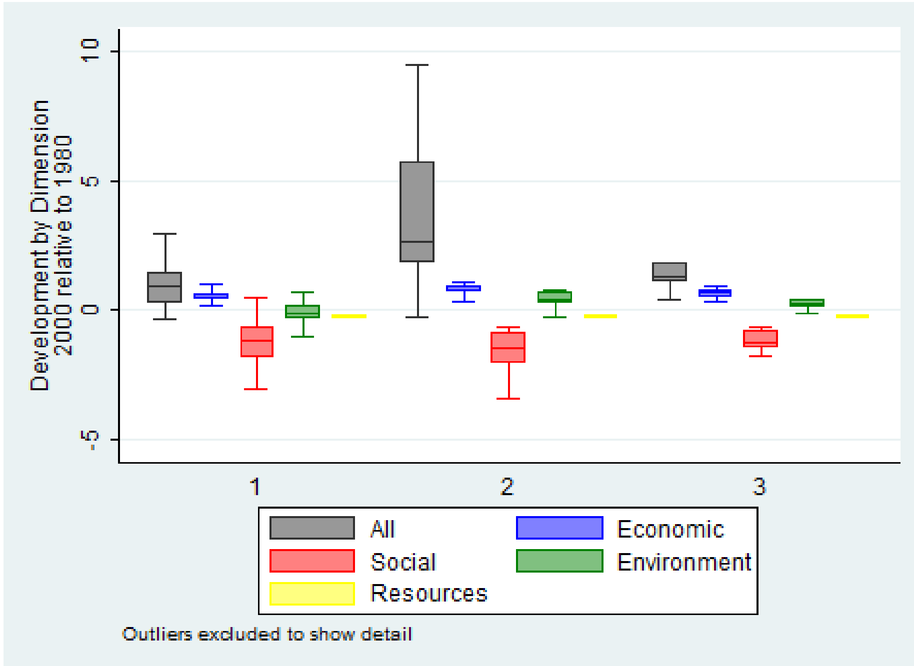

Figure 80: Distributions of development as relative change in GPI, by cluster and dimension with outliers removed

Table 54: Regression models including important context variables with clusters

VARIABLES	(1) Overall	(2) Econ	(3) Social	(4) Env	(5) Rsrc
Population					1.29e-07**
					(1.45e-08)
Pop Grow		-0.0132	-0.152***	0.0441**	0.00164
		(0.00941)	(0.00996)	(0.00572)	(0.000637)
Live & Work				-0.264	-0.0834**
				(0.131)	(0.0157)
HH Income		1.82e-05**		1.02e-05*	
		(2.32e-06)		(3.22e-06)	
Percent BS		-0.189			
		(0.228)			
Year	0.111	-0.000709	-0.0125		0.00189*
	(0.183)	(0.00208)	(0.0200)		(0.000453)
PQ	-1.737				
	(2.409)				
CSD	-3.552				
	(4.240)				
PQ Econ		-0.00480			
		(0.00714)			
CSD Econ		-0.0816			

Continued on next page

Table 54 (continued)

VARIABLES	(1) Overall	(2) Econ	(3) Social	(4) Env	(5) Rsrc
		(0.126)			
PQ Social			-0.105		
			(0.310)		
CSD Social			0.0845		
			(0.848)		
PQ Env				-0.0982	
				(0.0632)	
CSD Env				0.524*	
				(0.167)	
PQ Rsrc					-0.0175**
					(0.00370)
CSD Rsrc					-0.0733*
					(0.0189)
Constant	-214.0	1.291	23.97	-0.463*	-4.008**
	(358.0)	(4.188)	(39.78)	(0.139)	(0.903)
Observations	65	65	65	65	65
R^2	0.050	0.537	0.110	0.285	0.282

Models are for 4 dimensions of development and overall
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From this result, it is safe to say that the growth patterns represented by these clusters are different enough socioeconomically to explain some of their difference in development. In addition, plans do not vary considerably between growth pattern clusters. Although high population-slow growth, moderate population-high growth, and low population-moderate growth places are showing distinctly different development patterns, the similarities in plan quality and plan commitment to sustainable development suggest that either state guidance for planning may be well headed or that plans based on long-term interests (20 years in this case) may reflect similar needs despite the immediate concerns of a place.

6.3.6 Summary of the relationship between plans and development in metropolitan Atlanta

Plan quality was found to have a significant negative relationship with sustainable development, when dimensions are considered. This relationship was stronger for plans completed within the study time period (before 2000), suggesting that this relationship may be causal. The negative result is unexpected and leads to a rejection of the hypothesis that high quality planning would be significantly and positively related to development.

On the other hand, plan commitment to sustainable development was found to be weakly positively related to sustainable development although the dimensions of this relationship changed over time. As such, the hypothesis that commitment to sustainable development would be significantly and positively related to development cannot be rejected.

These results hold even when looking at distinct growth patterns across the metropolitan region, suggesting that the relationships between plans and development may be applicable to other places.

6.4 Discussion and alternative explanations

This chapter has shown the results of an analysis of development and planning. One of the three hypotheses was rejected, but two could not be. Throughout the section, possible explanations for the results have been discussed. These are reviewed here. Implementation is a black box in this analysis, the filter through which plans relate to development, based on the theoretical framework. Lack of strong relationships or positive relationships between planning and development may be due to the implementation. Implementation includes all of the policies in place in a jurisdiction and the methods by which they are used. These may include some or all of those policies included in plans and also likely include many others that are not included in long-range planning texts. So, the reality of policies on the ground in a jurisdiction, that are affecting welfare and development in that jurisdiction may be much different than the policies characterized by policy statements in plan texts. As mentioned in this chapter, plans around metropolitan Atlanta tend to be either rigid (high quality) or visionary (high commitment to sustainable development); rigid plans are not associated with better development as was expected. This may reflect the importance of flexibility in implementation.

Several external characteristics were expected to have influence on welfare, development, and planning in a jurisdiction. However, for the most part these characteristics were not found to be significant. Population growth was found to be significantly related to welfare and development, but only after removing three influential cases. In addition, all of the characteristics of the population were related to absolute welfare, but they were less useful in describing the variation in development (change in welfare). Other variables that are not accounted for here might explain the change in development, such as quality of education, or types of available occupations. Planning characteristics were not significantly related to plan quality, but commitment to sustainable development in plans increased over time; this may be due to changing state requirements.

The measure of sustainable development, the GPI, may not be a good measure of development. Although GPI was found to be reasonable using the test of the HDI measure, this indicates only that they are related. It is possible that both the GPI and the HDI are representing something other than development or another measure or critical component of development is excluded. In addition, HDI could only be calculated at the county level; there is no test for the reasonableness of GPI as a measure of welfare in cities. Indeed, the small population of some cities may lead to highly influential individuals - for example, if one high income earner moves in or out of a small community, that could affect the per capita income without any real change in individual welfare of the people in the community. Some components of the GPI were measured using national or state level, rather than local level, data; this may lead to errors in representation of development in local jurisdictions.

In addition to potential weaknesses in the measure of welfare, there is the potential for flaws in the plan evaluation. It is possible that the plans evaluated are not representative of plans in metropolitan Atlanta even though the places for which plans were identified were found to be representative of metropolitan Atlanta. Also, almost half of the plans evaluated were from after the last year of the study time frame; although this is accounted for in the analysis of the relationship between plans and development, it limits the amount of Atlanta represented by the study. In addition, plans may not adequately reflect planning; the act of planning may lead to relationships and considerations that are more valuable and important than the plan text itself. While the plan text is required for jurisdictions to maintain their quality government standing and be eligible for state money, the legacy of a successful planning process may carry greater weight.

Even if the plans included are a good representation of planning in Atlanta, the plan process, and actual implementation, evaluation of the plans in this study could have been inadequate. Only policy statements were evaluated even though there are many other portions of a plan which could be considered, including goals and ease of access. Details of what might be measured in plan evaluation is given in Chapter 3. It is possible that policy statements did not represent the quality of plans or their commitment to sustainable development. The measure of quality could be lacking; although strong, specific, and measurable statements are easy to transfer into implementable actions, they may also lack vision or flexibility. The measure of commitment to sustainable development was limited to six principles of sustainable development based on previous studies of the same phenomenon (Berke and Conroy, 2000; Conroy and Berke, 2004). Despite their previous use, these principles do not include other ideals that jurisdictions may associate with sustainable development, such as strong education or health. It may also be that policy statements appear to be related or committed to sustainable development (or not) not by actual commitment but simply due to phrasing. This is especially probable with the principle of harmony with nature - statements may appear to be committed to this principle but actually focused on safety or tourism/economic development.

The last major alternative explanation is time. In this chapter, it has been found that the year of the plan does matter for the commitment to sustainable development in a plan and to whether or not the relationship between plan quality and development is significant. However, it is possible that these relationships will change more as more years of data are available. Long-range plans consider 20 years into the future. This means that plans completed in 1990 would have their end-year in 2010. Since data are only available to calculate development as late as 2000, effects of these plans from 2000 to 2010 are not observed.

CHAPTER VII

CONCLUSIONS

This dissertation research has assessed development, planning, and the relationship between the two for metropolitan Atlanta, Georgia. Overall, metropolitan Atlanta shows weakly sustainable development that is negatively related to good quality planning. Development was not strongly sustainable anywhere in metropolitan Atlanta, with most places improving overall welfare and economic welfare at the expense of social and resource welfare; within these dimensions, the negative relationship with plan quality is even stronger.

This chapter will summarize the findings from the results given in Chapter 6, discuss the policy implications of these findings and highlight future work.

7.1 Findings

7.1.1 Metropolitan Atlanta Development

Metropolitan Atlanta's development from 1980 to 2000 was measured based on the change in welfare as measured by the GPI. Some modifications were made to the GPI method to allow measurement at this scale and to ensure comparability. If welfare in 2000 was at least as high as in 1980, the development would be considered weakly sustainable. If welfare without substitutions between dimensions was at least as high in 2000 as in 1980, the development would be considered strongly sustainable. No hypotheses were put forth for whether or not development in metropolitan would be sustainable.

The GPI/capita measure was possible to construct at the local level and aggregate to the metropolitan level for Atlanta; however, many variables in the GPI rely on national costs or weightings, limiting their usefulness. Local governments wanting to use the GPI as a measure could collect data to support local development of the measures or substitute measures of similar goods and services. The former ensures smoother aggregation to the metropolitan level and comparability with other governments while the latter may be more feasible. Even considering the data limitations, the idea that a welfare measure including all four dimensions of sustainable development could be constructed at the local level and then combined to account for different geographies opens up a new way of looking at measuring sustainable development and how it might be used in policy-making.

Development in metropolitan Atlanta was found to be weakly sustainable, on average, from 1980 to 2000, based on the change in welfare as measured by the GPI. However, both the social and the resources dimension did not develop sustainably over this time period. This means that metropolitan Atlanta was not strongly sustainable over the time period. Income dominates the welfare measure; higher incomes are coming at the cost of degrading social, built, and natural capital. Much greater differences in welfare and development were seen at the city level than at the county level; where all counties had positive change in welfare, 17 cities had declining welfare. Cities also had lower welfare, on average, than counties; this is perhaps an artifact of wealthy commuters or retirees living in unincorporated areas of counties of metropolitan Atlanta.

The HDI was also calculated in order to have a check on the reasonableness of the GPI as a measure of welfare in metropolitan Atlanta . The HDI was possible to construct at the county level and could be developed at the city level if measures for adult literacy, or a substitute, was used. Creating an HDI across the metropolitan Atlanta area allows for simple and quick comparison of social welfare based on knowledge, health, and purchasing power. Variation in welfare as measured by the GPI was confirmed by the HDI. Counties with cities that had unsustainable development, as measured by a decline in welfare from 1980 to 2000, also had lower HDI measures - literacy, life expectancy, and incomes, than those where welfare was improving.

7.1.2 Plan quality and commitment to sustainable development in metropolitan Atlanta

Of 2564 policy statements, 541 (or 21%) were high quality statements scoring 4/4 points while 708 (or 28%) received no quality points - they were weakly worded, vague, and not measurable. The other 51% were some combination of one or two of the quality areas: strong, specific, or measurable. The range of plan quality scores is from 1.3 to 3.2 with a mean of 2.3. The "best" plan then includes statements that are usually strongly worded, measurable, and specific while the worst includes statements that are sometimes strongly worded or measurable or specific. No external characteristics were found to be significantly related to plan quality.

The average commitment to sustainable development is 39% with a minumum of 9% and a maximum of 80%. This means that all plans included some statements based on these six principles of sustainable development. The least likely issue area to show commitment to sustainable development was community facilities and services. Characteristics of the plan and population are not related to commitment to sustainable development, but two characteristics of the jurisdiction, the percent of people living and working in the same place and the population are postively and significantly related to commitment to sustainable development.

Policy statements coded as committed to principles of sustainable development were positively and significantly likely to be of high quality compared to statements not coded as committed. However, the relationship is weaker when considering plans that have higher average statement quality or higher commitment to sustainable development. Commitment to sustainable development is positively correlated with plan quality only within the environment dimension. Plans with high quality statements in the environment dimension, are positively and significantly related to higher commitment to sustainable development in the environment dimension; some inter-dimensional relationships also exist between quality and commitment in environment, resources, and economics dimensions.

The weakness of the relationship between identified external characteristics lends support to previous calls for more research into other measures of community, implementation, and the planning process itself. In addition, the possibility that the principles of sustainable development relied upon to measure commitment were improperly specified. Future work might also highlight the effects of focusing on a particular issue area with outcome variables related to that issue area, such as land use or sustainable development.

7.2 Hypotheses

One of the hypotheses were rejected and two were not. Largely, the theoretical framework remains intact; planning is related to development. However, the findings suggest that the contextual variables that were included are not appropriate. Some other variables that represent the differences in places may need to be identified to properly represent the context of a place which influences planning. In addition, implementation and planning characteristics are important and should be further developed in future work.

- **H1: High quality planning will be positively and significantly related to sustainable development**

  This hypothesis was rejected. The coefficient of correlation was negative and insignificant for all plans and negative and significant when limiting plans to those completed before year 2000. Breaking down the measure of sustainable development and the measures of plan quality into the issue areas yielded more significant relationships. However, all of the significant relationships were negative, implying that higher quality plans do not lead to improved welfare.

- **H2: Commitment to sustainable development will be positively and significantly related to sustainable development**

  This hypothesis was not rejected. The coefficient of correlation overall was positive and significant. Breaking down the measure of sustainable development to relate to the commitment to sustainable development also yielded weakly significant results. Three of these positive relationships are (weakly, at 10% and 5%) significant: The commitment to sustainable development principles in the economic dimension on social welfare development and the commitment to sustainable development principles in the environment dimension on environmental welfare development and overall development. For plans before 2000, the overall commitment to sustainable development as well as that in the environment and resources portion of the plan are positively and significantly related to more sustainable environmental welfare. This suggests that there may be weak support for the hypothesis that commitment to sustainable development in plans leads to better welfare.

- **H3: High quality planning will be correlated with a commitment to sustainable development** This hypothesis was not rejected. Policy statements coded as committed to principles of sustainable development were positively and significantly likely to be of high quality compared to statements not coded as committed. Plan quality overall was also found to be positively and significantly related to higher commitment to sustainable development overall after controlling for three influential cases.

7.3 Policy Implications

Primary findings of plan quality having a significant and negative relationship to development suggest that simply making plan policy statements more specific, strong, and measurable will not lead to better welfare or development. However, this is guarded advice; although high quality plans were negatively related to development, that does not mean that the high quality plans were the cause of poor development.

Another primary finding of commitment to sustainable development having a weakly significant positive relationship to development, suggesting that planning focused on the principles of sustainable development is related to improved welfare and development. Although no causal relationship can be determined, this finding suggests that including considerations of sustainable development principles may be a good idea for planning. It might be that commitment to sustainable development in plans and development are both related to another variable that is not measured here.

The third primary finding for this research is that higher quality statements are more likely to also be committed to sustainable development, but plans with higher mean quality scores are not more likely to have higher commitment to sustainable development. This has two implications. First, well-considered statements may include both a visionary element with commitment to sustainable development principle and strongly worded, measurable, specific policy actions. Second, plans which are terse and to the point, reading like an action list, may not include as much of the reasoning in policy statements that leads to higher commitment to sustainable development. These implications suggest that there is a trade-off in the plans reviewed, although plan statements that are higher quality are also more likely to be committed to sustainable development, plans which have more commitment to sustainable development may include many policy statements that are written more as goals than as strong, measurable, specific policies. Planners may do well to acknowledge that there may be a trade-off and see if there is difficulty in translating policy statements to implementation if the reasoning behind statements is not included.

Each of these three primary findings of this dissertation research suggests again the importance of either the planning process or the implementation process, or both. If plans are indeed driving implementation and development, as theorized, it may be that more visionary, principled statements translate into better implementation because there is less doubt about what the point of the policy is - even if high quality statements represent clearer action items. A policy action statement without a point that implementers can identify may not be implemented at all, or they may be changed in a way that no longer reflects the original intent. This can be related to everyday by considering the simple shopping list; if the list has milk on it, but you don't recall why you wanted milk, you may not buy it.

The lack of relationships between the characteristics of planning, jurisdictions, and populations provides three useful insights. First, planners may create the same kind of plan regardless of conditions because they are trained professionals who tend to be more like each other than like the places in which they work. Second, comprehensive planning guidance may be more top-down than it appears based on Georgia law; local places may be reliant on their respective development centers or may follow model plans. Third, several plans were prepared by private consultants who may not represent the views of the jurisdictions for which they prepare the plans - not to say that they create plans on their own, but they may make wording suggestions or ensure the inclusion of particular statements or areas. Although not enough information about the writers of the plans or the relationships between consultants and places is known to discuss the implications at this time, it does provide an object of interest for future inquiry.

Even when controlling for growth patterns as seen in different parts of metropolitan regions (high population-slow growth, moderate population-fast growth, and low population-moderate growth), the relationships (or lack of) between plan quality, commitment to sustainable development, and development hold. This suggests that the findings may be generalizable to other places that are not seeing the same growth patterns as metropolitan Atlanta as a whole, such as other parts of Georgia or other metropolitan areas. It also suggests that the relationships between plans and development are more subtle or depend on other factors not identified in this study.

7.4 Contributions

This dissertation makes the following contributions to advancing understanding of planning and sustainable development. Two of the major contributions of this work are methodological because of criticism of previous applications of methods to measure sustainable development and plan quality.

The theoretical contributions stem from the analysis to answer the research question, are discussed throughout the results in Chapter 6, have been discussed above, and are summarized here.

- This research modifies the GPI method of measuring welfare for application to local jurisdictions in a way that allows both assemblage of higher jurisdiction, such as regional, results and meaningful comparison across jurisdictions and time. Implications of using the GPI, along with its assumptions, are explicitly discussed in assessing static welfare and development (change in welfare); see sections 2.3.3 and 2.3.4 for details on these implications and the measures taken to avoid some of the pitfalls previously associated with the GPI. Previous applications of the GPI have focused on static welfare at points in time. The GPI was not able to be used to measure development because of indexed variables and the substitutions between types of welfare; breaking up the GPI into dimensions and avoiding indexing overcomes this difficulty. The GPI also did not allow for comparison across places due to the indexed income inequality measure; changing the method to include income inequality does allow for meaningful comparison. Previous applications of the GPI at the local level (in both Vermont and Ohio) do not attempt to aggregate data to discuss a metropolitan area; their data could not have been aggregated because of indexed income inequality.

- This dissertation research demonstrates the applicability of separating the concept of quality of plan texts and the degree to which a plan addresses a particular issue, such as sustainable development. Previous evaluations of plan quality were almost always based on specific areas of interest, such as compact development or flood mitigation; thus, the resulting plan quality only had meaning within the context of the area of interest. Using content analysis, this research presented a coding method that could categorize statements by the way they were related to the particular interest of this study and separately assess plan quality. This method could be extended to other interest areas and to additional characteristics of plan texts, such as goals. Other researchers could rely on the same data for plan quality and compare it to different assessments of planning and issues in the same jurisdiction.

- The primary research question led to the theoretical contributions of this dissertation which assesses the relationship between planning and actual outcomes. Connections between planning and outcomes are seldom addressed in the literature because of the difficulty with assessing implementation. In this dissertation, plan quality and plan commitment to sustainable development are compared to actual development over time. While admittedly with some limitations in data availability, the comparison was shown to be plausible to construct. The results of connecting the plan evaluations with measures of development lead to rejection of one hypothesis and failure to reject two hypotheses. These findings provide support for the theory that planning is related to development; however, the unmeasured effect of implementation may be critical to explaining the translation from plans to development. Commitment of plans to the principles of sustainable development was positively and significantly related to development, at least within dimensions. And, the quality of plans was negatively and significantly related to development, suggesting that stronger, more measurable, more specific policy statements may be in response to problems rather than positive planning. This research also finds little support for theoretical relationships between planning, development, and external characteristics; further research will be needed to identify important contextual variables to planning and development.

7.5 Recommendations for Future Work

7.5.1 Future Work measuring Welfare and Development

Potential problems with the measures of sustainable development used in this dissertation were discussed in Chapter 6 and include the possibilities that the measure covers something other than welfare or is not specific enough to local jurisdictions. These issues should be addressed in future work on measuring development with the GPI. In particular, work exploring or defining more concrete underlying theories for the GPI and its application would be useful; Lawn (2003) attempted to provide a theory for the GPI, but it relies only on the point of what is welfare. Future work on theory needs to consider how other theories involving welfare and social conditions, environmental conditions, and resource conditions. Another important area of work is in examining the reliability of the GPI as a measure of development at different levels of geography. Future work in this area could aggregate welfare and development measures to the state level and in other metropolitan areas using the GPI measure presented here. Metropolitan and similar place welfare and development could be compared to allow for identification of patterns across the nation rather than just within the Atlanta metropolitan area. Comparative analysis, interesting on its own, may also aid discussions of the theory, applicability, and reliability of the GPI as a measure of metropolitan development. Greater data availability at the local level for measuring sustainability could be helpful. Both conducting data collection at the local level and considering modifications to the measure of welfare to suit local data availability would be useful. Future work might identify applicable measures for which local data can be adequately collected and used, perhaps extending the International Urban Sustainability Indicators List (IUSIL) to fit rural counties as well. It may also be useful to conduct surveys to determine the relationship with self-defined welfare and measures of welfare using the GPI per capita and the HDI.

7.5.2 Future Work on Plan Quality and Commitment

Several possible problems with plan evaluation and alternative explanations for findings based on these are given in Chapter 6. Improvements that correct for these limitations may improve plan quality research in general and research connecting plans to outcomes specifically. Despite its potential shortcomings, the method presented here for plan quality and commitment to an issue area could be extended to other issue areas to test for the usefulness of the method. The four point method relying on strength, measurability, and specificity of statements could be evaluated further. Allowing a point for existence of a policy statement provides differentiation between a statement and no statement at all, an idea previously lacking in most measures of plan quality, has not been evaluated for usefulness. Some other measure of quality, such as a delphi study blindly assessing plan quality, might be used to determine if this method is really an improvement upon previous binary measures of plan quality.

One of the benefits of the method presented here is its separability. Researchers can use the same values of plan quality regardless of interest area. In addition, as more researchers use this method, plan quality measures can be compared across places, so long as the potential for subjectivity between research groups is acknowledged. Evaluating plan quality by that plan's focus on a particular issue area limits the usefulness of the quality measure for meta-analysis and our understanding of plan quality differences over space and time in general (Berke and Godschalk, 2009).

In addition, this method has the potential to shorten research needs as researchers could focus only on their subject matter of interest and rely on previous measures of plan quality, conducted for studies perhaps in different subject areas. For example, the commitment to natural hazard mitigation could be assessed in metropolitan Atlanta using the same plans as evaluated in this dissertation; researchers could rely on my already completed measures of plan quality to save time (approximately 30 hours per coder for the plans included here). Research from other areas could also provide an opportunity to examine the reliability of the method.

7.5.3 Future Work Connecting Plans to Outcomes

This dissertation research broke fairly new ground by assessing outcomes with planning. Such studies are rare because of the difficulties presented in finding data and making connections between plans and outcomes (particularly within implementation). Despite the near universal assumption that better planning, both texts and processes, would lead to better outcomes, the theory supporting this relationship between plans and outcomes is still in uncomfortably weak territory. Much additional work in this area is necessary and can build on the efforts presented here and on theories of the policy process in general. Additional research focusing on implementation of plans would be of tremendous value.

One finding of this study was that, despite the representativeness of the areas where plans were identified for evaluation for all of metro Atlanta, there are still gaps when the region is broken down into smaller pieces. The most pressing area for future work in this particular area would be to expand the scope of plan review. More plans would allow better testing of the relationships between planning and outcomes across geographies. For studies of planning and development in other geographies, the research plan should include as many plans as time and funding allow for study.

The time frame of study may have limited the ability of the method presented to yield significant results. Future work looking at plans and their outcomes may benefit from a longer delay. That is, older plans may be more valuable to this area of research than newer plans. The need for a longer time period may limit the geographies for which meaningful results can be found. For example, in Georgia, the local comprehensive plan became compulsory after year 1990; these plans attempt to plan 20 years into the future. Thus, the very first plans would just now be "complete;" making matters worse, many jurisdictions did not get their first plans out until year 2000. However, a few jurisdictions have a much longer history with planning, such as the City of Atlanta, which could allow for a longitudinal study of plan quality and development over time. While limiting the aggregation and comparability, taking advantage of the existence of much older plans could result in greater understanding of the relationship of plan quality to outcomes.

APPENDIX A

CONTEXT DETAILED DATA

A.1 Counties

Table 55: Characteristics by County

Place	Year	Population	Political Ideology[1]	Live & Work[2]	White	Race Black	Asian	Median Income[3]	Poverty	Graduates HS[4]	BS[5]
Barrow County	1980	21,482			0.85	0.15	0.00	33,379	0.17	0.38	0.07
Barrow County	1990	30,106	1.35	0.29	0.87	0.11	0.00	38,278	0.15	0.59	0.09
Barrow County	2000	46,561	0.49	0.21	0.85	0.10	0.02	46,370	0.08	0.73	0.11
Bartow County	1980	40,901			0.88	0.12	0.00	34,408	0.13	0.40	0.06
Bartow County	1990	56,360	1.46	0.47	0.90	0.09	0.00	38,300	0.11	0.59	0.09
Bartow County	2000	76,703	0.57	0.34	0.88	0.08	0.01	44,970	0.09	0.72	0.14
Butts County	1980	13,680			0.60	0.39	0.00	33,093	0.17	0.44	0.06
Butts County	1990	15,421	1.46	0.37	0.64	0.35	0.00	33,944	0.16	0.58	0.07
Butts County	2000	19,737	0.68	0.33	0.69	0.29	0.00	41,075	0.11	0.70	0.09
Carroll County	1980	56,661			0.82	0.17	0.00	33,193	0.16	0.47	0.11
Carroll County	1990	71,875	1.06	0.50	0.84	0.15	0.00	35,594	0.14	0.61	0.12
Carroll County	2000	88,009	0.52	0.47	0.81	0.16	0.01	39,963	0.14	0.71	0.17
Cherokee County	1980	52,245			0.98	0.02	0.00	42,057	0.11	0.52	0.10
Cherokee County	1990	91,323	0.84	0.24	0.97	0.02	0.00	54,282	0.06	0.75	0.18
Cherokee County	2000	143,783	0.41	0.21	0.92	0.02	0.01	62,723	0.05	0.84	0.27
Clayton County	1980	151,248			0.92	0.07	0.01	47,388	0.08	0.67	0.10
Clayton County	1990	182,769	1.31	0.14	0.73	0.24	0.03	46,526	0.09	0.77	0.15
Clayton County	2000	238,383	2.50	0.11	0.38	0.51	0.04	43,978	0.10	0.80	0.17
Cobb County	1980	300,588			0.94	0.05	0.01	50,853	0.06	0.72	0.23
Cobb County	1990	450,936	0.56	0.20	0.88	0.10	0.02	57,403	0.06	0.86	0.33
Cobb County	2000	612,633	0.86	0.17	0.72	0.19	0.03	60,038	0.06	0.89	0.40
Coweta County	1980	39,486			0.73	0.27	0.00	36,393	0.17	0.46	0.10
Coweta County	1990	54,487	1.00	0.44	0.77	0.23	0.00	44,376	0.11	0.67	0.13
Coweta County	2000	90,148	0.51	0.32	0.79	0.18	0.01	54,287	0.08	0.82	0.21
Dawson County	1980	4,824			0.97	0.00	0.00	29,050	0.19	0.37	0.04
Dawson County	1990	9,531	1.38	0.32	0.98	0.00	0.00	39,448	0.13	0.60	0.09

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Table 55 (continued)

Place	Year	Population	Political Ideology[1]	Live & Work[2]	Race White	Race Black	Race Asian	Median Income[3]	Poverty	Graduates HS[4]	Graduates BS[5]
Dawson County	2000	16,304	0.37	0.26	0.97	0.00	0.00	48,911	0.08	0.79	0.18
DeKalb County	1980	484,093			0.71	0.27	0.01	47,153	0.10	0.77	0.28
DeKalb County	1990	549,655	1.26	0.14	0.54	0.42	0.03	49,652	0.10	0.84	0.33
DeKalb County	2000	668,826	3.14	0.15	0.36	0.54	0.04	50,591	0.11	0.85	0.36
Douglas County	1980	54,863			0.94	0.05	0.00	47,623	0.08	0.57	0.09
Douglas County	1990	71,611	1.12	0.19	0.91	0.08	0.01	51,622	0.07	0.72	0.12
Douglas County	2000	92,700	0.68	0.22	0.77	0.18	0.01	51,611	0.08	0.81	0.19
Fayette County	1980	29,538			0.95	0.04	0.00	60,744	0.05	0.73	0.16
Fayette County	1990	63,212	0.66	0.31	0.92	0.05	0.02	69,732	0.03	0.87	0.26
Fayette County	2000	92,082	0.53	0.27	0.84	0.12	0.02	73,364	0.03	0.92	0.36
Forsyth County	1980	28,134			0.99	0.00	0.00	39,992	0.11	0.51	0.09
Forsyth County	1990	44,737	1.07	0.32	0.99	0.00	0.00	50,932	0.07	0.68	0.16
Forsyth County	2000	100,467	0.29	0.34	0.95	0.01	0.01	70,957	0.06	0.86	0.35
Fulton County	1980	592,790			0.48	0.51	0.00	33,210	0.21	0.66	0.23
Fulton County	1990	650,697	1.47	0.48	0.48	0.50	0.01	41,669	0.18	0.78	0.32
Fulton County	2000	817,145	1.79	0.42	0.48	0.44	0.03	48,741	0.16	0.84	0.41
Gwinnett County	1980	169,344			0.96	0.03	0.01	53,589	0.06	0.72	0.19
Gwinnett County	1990	356,979	0.78	0.18	0.91	0.05	0.03	60,490	0.04	0.87	0.30
Gwinnett County	2000	596,296	0.61	0.16	0.73	0.13	0.07	62,353	0.06	0.87	0.34
Haralson County	1980	18,543			0.93	0.07	0.00	30,759	0.15	0.42	0.07
Haralson County	1990	22,002	1.11	0.41	0.93	0.06	0.00	31,657	0.14	0.56	0.07
Haralson County	2000	25,832	0.55	0.32	0.93	0.05	0.00	32,606	0.15	0.63	0.09
Heard County	1980	6,529			0.83	0.17	0.00	30,242	0.17	0.36	0.04
Heard County	1990	8,688	1.94	0.24	0.86	0.13	0.01	29,903	0.19	0.49	0.06
Heard County	2000	11,085	0.78	0.26	0.87	0.11	0.01	34,029	0.14	0.66	0.07
Henry County	1980	36,488			0.82	0.17	0.00	44,854	0.10	0.54	0.09
Henry County	1990	59,885	1.01	0.19	0.89	0.10	0.01	52,195	0.06	0.73	0.11
Henry County	2000	121,572	0.57	0.12	0.81	0.15	0.02	59,028	0.05	0.84	0.20

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Table 55 (continued)

Place	Year	Population	Political Ideology[1]	Live & Work[2]	Race White	Race Black	Race Asian	Median Income[3]	Poverty	Graduates HS[4]	Graduates BS[5]
Jasper County	1980	7,548			0.60	0.40	0.00	30,363	0.20	0.41	0.09
Jasper County	1990	8,495	1.60	0.35	0.64	0.35	0.00	35,773	0.17	0.65	0.11
Jasper County	2000	11,488	0.65	0.41	0.71	0.27	0.01	41,087	0.14	0.70	0.12
Lamar County	1980	12,218			0.65	0.34	0.00	32,152	0.16	0.46	0.08
Lamar County	1990	13,056	1.49	0.50	0.66	0.34	0.00	32,437	0.16	0.58	0.10
Lamar County	2000	15,969	0.84	0.31	0.68	0.29	0.00	38,200	0.11	0.71	0.11
Meriwether County	1980	21,255			0.55	0.45	0.00	28,973	0.21	0.39	0.07
Meriwether County	1990	22,447	2.07	0.39	0.55	0.45	0.00	28,095	0.22	0.52	0.07
Meriwether County	2000	22,527	1.09	0.31	0.56	0.42	0.00	32,826	0.18	0.66	0.11
Newton County	1980	34,974			0.74	0.25	0.00	36,836	0.14	0.45	0.09
Newton County	1990	42,045	1.31	0.40	0.77	0.22	0.00	38,909	0.14	0.60	0.10
Newton County	2000	62,883	0.72	0.34	0.75	0.22	0.01	46,221	0.10	0.75	0.15
Paulding County	1980	26,299			0.96	0.04	0.00	36,625	0.12	0.42	0.04
Paulding County	1990	42,004	1.32	0.25	0.95	0.04	0.00	45,988	0.09	0.64	0.08
Paulding County	2000	83,004	0.44	0.15	0.90	0.07	0.01	53,726	0.06	0.81	0.15
Pickens County	1980	11,701			0.97	0.03	0.00	29,713	0.17	0.38	0.07
Pickens County	1990	14,510	1.33	0.35	0.98	0.01	0.00	35,095	0.13	0.57	0.09
Pickens County	2000	23,359	0.45	0.43	0.96	0.02	0.00	42,629	0.09	0.70	0.16
Pike County	1980	8,910			0.73	0.26	0.00	36,343	0.15	0.47	0.09
Pike County	1990	10,317	1.11	0.21	0.79	0.20	0.00	38,549	0.13	0.65	0.09
Pike County	2000	13,798	0.44	0.16	0.83	0.15	0.00	45,701	0.10	0.75	0.14
Rockdale County	1980	36,845			0.90	0.09	0.01	49,488	0.08	0.63	0.13
Rockdale County	1990	54,656	0.84	0.28	0.90	0.08	0.01	54,751	0.06	0.78	0.18
Rockdale County	2000	70,566	0.70	0.28	0.76	0.18	0.02	55,207	0.08	0.82	0.23
Spalding County	1980	48,127			0.72	0.27	0.00	32,283	0.18	0.44	0.09
Spalding County	1990	54,717	1.16	0.50	0.70	0.29	0.00	35,631	0.16	0.60	0.11
Spalding County	2000	58,486	0.62	0.40	0.66	0.31	0.01	37,308	0.15	0.68	0.12
Walton County	1980	31,203			0.78	0.21	0.00	32,785	0.17	0.38	0.07

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Table 55 (continued)

Place	Year	Population	Political Ideology[1]	Live & Work[2]	White	Race Black	Asian	Median Income[3]	Poverty	Graduates HS[4]	BS[5]
Walton County	1990	38,757	1.42	0.39	0.81	0.18	0.00	39,195	0.13	0.58	0.09
Walton County	2000	61,559	0.46	0.29	0.83	0.14	0.01	47,873	0.10	0.73	0.13

1. Political ideology is relative with higher number indicating more democratic party votes
2. Live & work is the portion of the population living and working in the same place
3. Median income is median household income for the jurisdiction in year 2000 USD
4. HS graduates includes high school diploma or equivalent
5. BS graduates includes all graduates with a 4 year degree or more

Live & work, race, and graduates are reported as portions of population (>16,all,>25)

A.2 Cities

Table 56: Characteristics by City

Place	Year	Population	Live & Work[1]	White	Race Black	Asian	Median Income[2]	Poverty	Graduates HS[3]	BS[4]
Acworth	1980	3,648		0.90	0.08	0.00	40,035	0.10	0.49	0.12
Acworth	1990	5,202	0.19	0.91	0.07	0.00	40,619	0.12	0.63	0.15
Acworth	2000	13,422	0.11	0.79	0.13	0.03	52,446	0.08	0.85	0.29
Aldora	1980	149		0.29	0.29	0.29	23,081	0.29	0.41	0.00
Aldora	1990	145	0.00	1.00	0.00	0.00	26,931	0.15	0.49	0.04
Aldora	2000	98	0.00	1.00	0.00	0.00	22,745	0.12	0.73	0.04
Alpharetta	1980	3,128		0.99	0.01	0.00	52,646	0.07	0.62	0.16
Alpharetta	1990	13,984	0.20	0.95	0.03	0.01	61,626	0.04	0.92	0.37
Alpharetta	2000	34,854	0.31	0.83	0.07	0.05	73,343	0.05	0.95	0.57
Atlanta	1980	425,022		0.32	0.67	0.00	26,819	0.28	0.60	0.21
Atlanta	1990	393,760	0.67	0.31	0.67	0.01	30,962	0.27	0.70	0.27
Atlanta	2000	416,474	0.59	0.33	0.61	0.02	35,813	0.24	0.77	0.35
Auburn	1980	673		0.24	0.24	0.24	26,574	0.24	0.30	0.02
Auburn	1990	3,231	0.07	0.95	0.02	0.01	48,094	0.08	0.76	0.11
Auburn	2000	6,904	0.08	0.87	0.02	0.05	52,886	0.05	0.80	0.10
Austell	1980	3,935		0.92	0.08	0.00	36,702	0.12	0.43	0.05
Austell	1990	4,281	0.11	0.90	0.09	0.01	38,243	0.10	0.62	0.07
Austell	2000	5,359	0.12	0.60	0.27	0.00	40,101	0.13	0.65	0.10
Avondale Estates	1980	1,313		0.98	0.00	0.01	57,203	0.03	0.87	0.42
Avondale Estates	1990	2,691	0.13	0.95	0.04	0.01	60,629	0.03	0.90	0.50
Avondale Estates	2000	2,609	0.11	0.87	0.08	0.02	72,744	0.03	0.98	0.67
Ball Ground	1980	649		1.00	0.00	0.00	24,912	0.18	0.33	0.07
Ball Ground	1990	899	0.14	0.99	0.00	0.00	34,501	0.14	0.49	0.08
Ball Ground	2000	730	0.08	1.00	0.00	0.00	47,251	0.12	0.68	0.12
Barnesville	1980	4,887		0.54	0.46	0.00	25,819	0.23	0.41	0.09
Barnesville	1990	5,140	0.55	0.48	0.51	0.00	27,172	0.23	0.59	0.13

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Table 56 (continued)

Place	Year	Population	Live & Work[1]	Race White	Race Black	Race Asian	Median Income[2]	Poverty	Graduates HS[3]	Graduates BS[4]
Barnesville	2000	5,972	0.34	0.47	0.50	0.00	31,286	0.20	0.71	0.13
Berkeley Lake	1980	511		0.99	0.00	0.01	69,130	0.01	0.87	0.39
Berkeley Lake	1990	791	0.06	0.96	0.00	0.02	90,942	0.01	0.94	0.49
Berkeley Lake	2000	1,695	0.12	0.81	0.04	0.13	112,683	0.02	0.98	0.67
Bethlehem	1980	284		0.06	0.06	0.06	33,634	0.06	0.25	0.04
Bethlehem	1990	445	0.19	0.99	0.01	0.00	32,665	0.18	0.46	0.08
Bethlehem	2000	716	0.10	0.90	0.03	0.01	48,925	0.07	0.71	0.05
Bowdon	1980	1,743		0.83	0.16	0.01	33,349	0.13	0.50	0.12
Bowdon	1990	1,974	0.39	0.79	0.21	0.00	26,101	0.18	0.59	0.07
Bowdon	2000	1,959	0.30	0.73	0.24	0.00	28,711	0.17	0.66	0.13
Braswell	1980	257		0.89	0.11	0.00	35,145	0.03	0.11	0.00
Braswell	1990	70	0.03	0.99	0.01	0.00	39,094	0.10	0.51	0.04
Braswell	2000	80	0.00	1.00	0.00	0.00	39,398	0.13	0.51	0.00
Bremen	1980	3,967		0.89	0.10	0.00	32,618	0.14	0.48	0.13
Bremen	1990	4,404	0.46	0.89	0.11	0.00	29,911	0.10	0.65	0.12
Bremen	2000	4,579	0.36	0.89	0.09	0.00	30,235	0.10	0.70	0.16
Brooks	1980	203		0.13	0.13	0.13	24,111	0.13	0.46	0.03
Brooks	1990	328	0.04	0.95	0.05	0.00	56,592	0.04	0.78	0.10
Brooks	2000	553	0.09	0.97	0.01	0.02	66,950	0.02	0.88	0.09
Buchanan	1980	1,014		0.88	0.12	0.01	25,662	0.22	0.28	0.06
Buchanan	1990	996	0.27	0.83	0.17	0.00	26,236	0.22	0.42	0.06
Buchanan	2000	941	0.24	0.86	0.12	0.00	23,967	0.23	0.56	0.07
Buford	1980	6,697		0.82	0.18	0.00	35,160	0.12	0.41	0.06
Buford	1990	8,909	0.30	0.83	0.14	0.00	35,804	0.14	0.61	0.08
Buford	2000	10,668	0.25	0.76	0.12	0.02	39,895	0.11	0.68	0.13
Canton	1980	3,601		0.91	0.08	0.00	28,993	0.18	0.39	0.13
Canton	1990	5,778	0.41	0.87	0.09	0.00	29,788	0.14	0.57	0.15
Canton	2000	7,709	0.35	0.78	0.06	0.01	41,572	0.11	0.66	0.16

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Table 56 (continued)

Place	Year	Population	Live & Work[1]	Race			Median Income[2]	Poverty	Graduates	
				White	Black	Asian			HS[3]	BS[4]
Carl	1980	258		0.19	0.19	0.19	31,324	0.19	0.30	0.06
Carl	1990	263	0.10	1.00	0.00	0.00	33,881	0.08	0.74	0.24
Carl	2000	205	0.03	0.97	0.03	0.00	46,780	0.06	0.67	0.07
Carrollton	1980	14,078		0.71	0.28	0.00	27,644	0.22	0.51	0.20
Carrollton	1990	16,439	0.64	0.69	0.29	0.00	28,585	0.21	0.64	0.21
Carrollton	2000	19,843	0.60	0.63	0.33	0.01	28,386	0.23	0.72	0.28
Cartersville	1980	9,508		0.80	0.20	0.00	31,246	0.13	0.44	0.10
Cartersville	1990	12,817	0.61	0.82	0.18	0.00	35,284	0.15	0.61	0.14
Cartersville	2000	15,925	0.47	0.75	0.16	0.02	42,397	0.11	0.73	0.23
Centralhatchee	1980	238		0.12	0.12	0.12	33,069	0.12	0.44	0.04
Centralhatchee	1990	396	0.03	0.94	0.06	0.00	35,742	0.13	0.56	0.06
Centralhatchee	2000	383	0.10	0.93	0.07	0.00	38,947	0.05	0.80	0.11
Chamblee	1980	7,137		0.92	0.05	0.02	40,209	0.10	0.73	0.19
Chamblee	1990	7,655	0.16	0.54	0.19	0.12	37,748	0.23	0.67	0.24
Chamblee	2000	9,552	0.12	0.46	0.05	0.15	47,372	0.23	0.55	0.22
Clarkston	1980	4,539		0.91	0.07	0.01	40,078	0.06	0.79	0.22
Clarkston	1990	5,376	0.05	0.37	0.55	0.06	40,270	0.12	0.87	0.23
Clarkston	2000	7,231	0.04	0.17	0.61	0.12	38,559	0.19	0.79	0.22
College Park	1980	24,632		0.51	0.48	0.01	35,655	0.17	0.68	0.15
College Park	1990	19,973	0.16	0.21	0.74	0.04	30,850	0.23	0.75	0.17
College Park	2000	20,382	0.14	0.13	0.81	0.01	31,771	0.19	0.77	0.17
Concord	1980	312		0.14	0.14	0.14	32,188	0.14	0.36	0.11
Concord	1990	223	0.13	0.88	0.12	0.00	26,063	0.27	0.70	0.20
Concord	2000	336	0.16	0.73	0.26	0.00	42,019	0.05	0.79	0.23
Conyers	1980	6,567		0.79	0.19	0.01	39,365	0.10	0.57	0.10
Conyers	1990	8,397	0.32	0.77	0.22	0.00	36,722	0.15	0.69	0.13
Conyers	2000	10,689	0.31	0.57	0.34	0.03	36,863	0.17	0.73	0.17
Covington	1980	10,586		0.56	0.44	0.00	31,307	0.20	0.40	0.09

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Table 56 (continued)

Place	Year	Population	Live & Work[1]	Race White	Black	Asian	Median Income[2]	Poverty	Graduates HS[3]	BS[4]
Covington	1990	9,890	0.51	0.54	0.46	0.00	29,668	0.24	0.50	0.09
Covington	2000	11,547	0.40	0.53	0.46	0.00	32,957	0.20	0.62	0.13
Cumming	1980	2,059		0.98	0.00	0.00	31,478	0.16	0.45	0.08
Cumming	1990	2,998	0.32	0.93	0.00	0.00	38,078	0.11	0.50	0.10
Cumming	2000	4,220	0.34	0.87	0.03	0.00	39,384	0.18	0.65	0.17
Dacula	1980	1,577		0.99	0.00	0.00	41,611	0.12	0.46	0.05
Dacula	1990	2,224	0.10	0.99	0.00	0.00	53,614	0.05	0.72	0.11
Dacula	2000	3,848	0.08	0.91	0.05	0.02	59,251	0.02	0.83	0.14
Dallas	1980	2,508		0.90	0.10	0.00	31,991	0.15	0.40	0.08
Dallas	1990	3,092	0.35	0.87	0.12	0.00	25,290	0.27	0.48	0.05
Dallas	2000	5,056	0.13	0.88	0.09	0.01	34,763	0.10	0.69	0.10
Dawsonville	1980	393		0.16	0.16	0.16	28,979	0.16	0.46	0.09
Dawsonville	1990	474	0.32	1.00	0.00	0.00	30,189	0.26	0.52	0.06
Dawsonville	2000	619	0.26	0.96	0.01	0.00	35,357	0.12	0.72	0.15
Decatur	1980	18,404		0.58	0.41	0.00	32,470	0.16	0.67	0.28
Decatur	1990	17,323	0.20	0.60	0.39	0.01	37,256	0.18	0.79	0.41
Decatur	2000	18,147	0.21	0.66	0.30	0.02	48,817	0.12	0.88	0.56
Doraville	1980	7,414		0.95	0.03	0.02	48,076	0.12	0.76	0.19
Doraville	1990	7,644	0.12	0.70	0.19	0.07	44,536	0.07	0.81	0.22
Doraville	2000	9,862	0.11	0.48	0.14	0.09	41,860	0.15	0.61	0.13
Douglasville	1980	7,641		0.79	0.21	0.00	35,612	0.17	0.52	0.12
Douglasville	1990	12,704	0.25	0.79	0.19	0.01	42,082	0.14	0.69	0.17
Douglasville	2000	20,065	0.24	0.63	0.31	0.01	46,648	0.12	0.82	0.26
Duluth	1980	2,956		0.90	0.10	0.00	48,743	0.06	0.59	0.15
Duluth	1990	9,988	0.18	0.90	0.06	0.02	59,588	0.03	0.87	0.32
Duluth	2000	22,122	0.13	0.69	0.12	0.12	61,891	0.04	0.93	0.46
East Point	1980	37,486		0.57	0.42	0.00	35,180	0.13	0.65	0.15
East Point	1990	34,450	0.15	0.31	0.66	0.01	37,234	0.17	0.72	0.18

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Table 56 (continued)

Place	Year	Population	Live & Work[1]	Race White	Race Black	Race Asian	Median Income[2]	Poverty	Graduates HS[3]	Graduates BS[4]
East Point	2000	39,595	0.10	0.16	0.78	0.00	32,830	0.21	0.76	0.18
Emerson	1980	1,116		0.75	0.25	0.00	33,724	0.16	0.36	0.00
Emerson	1990	1,076	0.07	0.81	0.19	0.00	30,877	0.11	0.50	0.03
Emerson	2000	1,092	0.05	0.78	0.20	0.01	37,266	0.16	0.62	0.05
Ephesus	1980	180		0.18	0.18	0.18	27,302	0.18	0.32	0.07
Ephesus	1990	324	0.04	1.00	0.00	0.00	24,957	0.34	0.46	0.07
Ephesus	2000	388	0.14	0.98	0.00	0.00	42,058	0.14	0.76	0.13
Euharlee	1980	469		0.14	0.14	0.14	40,453	0.14	0.43	0.04
Euharlee	1990	850	0.01	0.98	0.02	0.00	41,845	0.08	0.53	0.03
Euharlee	2000	3,208	0.05	0.87	0.08	0.01	55,325	0.03	0.79	0.13
Fairburn	1980	3,466		0.78	0.21	0.00	39,876	0.12	0.52	0.11
Fairburn	1990	4,579	0.18	0.66	0.33	0.01	40,133	0.14	0.75	0.10
Fairburn	2000	5,464	0.13	0.42	0.48	0.02	40,869	0.08	0.78	0.18
Fayetteville	1980	2,715		0.91	0.08	0.01	48,226	0.09	0.68	0.14
Fayetteville	1990	5,609	0.28	0.92	0.06	0.01	50,351	0.05	0.78	0.18
Fayetteville	2000	11,148	0.20	0.77	0.18	0.01	56,864	0.03	0.91	0.31
Flovilla	1980	459		0.60	0.40	0.00	21,143	0.22	0.24	0.03
Flovilla	1990	607	0.08	0.46	0.51	0.00	31,944	0.13	0.45	0.04
Flovilla	2000	652	0.03	0.40	0.60	0.00	39,340	0.12	0.58	0.03
Forest Park	1980	18,782		0.92	0.07	0.01	40,806	0.07	0.58	0.06
Forest Park	1990	17,393	0.22	0.77	0.19	0.02	36,115	0.12	0.64	0.07
Forest Park	2000	21,447	0.17	0.46	0.37	0.06	34,563	0.15	0.65	0.07
Franklin	1980	719		0.73	0.27	0.00	23,445	0.28	0.26	0.06
Franklin	1990	876	0.49	0.66	0.33	0.01	19,252	0.37	0.44	0.07
Franklin	2000	902	0.47	0.70	0.29	0.00	19,699	0.28	0.52	0.09
Gay	1980	171		0.26	0.26	0.26	22,258	0.26	0.57	0.17
Gay	1990	133	0.38	0.57	0.43	0.00	19,808	0.28	0.46	0.13
Gay	2000	149	0.05	0.57	0.43	0.00	27,467	0.25	0.77	0.13

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Table 56 (continued)

Place	Year	Population	Live & Work[1]	Race White	Race Black	Race Asian	Median Income[2]	Poverty	Graduates HS[3]	Graduates BS[4]
Good Hope	1980	207		0.01	0.01	0.01	28,868	0.01	0.35	0.16
Good Hope	1990	194	0.06	0.87	0.13	0.00	56,035	0.08	0.72	0.15
Good Hope	2000	210	0.02	0.93	0.03	0.02	44,548	0.13	0.73	0.14
Grantville	1980	1,117		0.65	0.34	0.00	22,639	0.23	0.28	0.02
Grantville	1990	1,194	0.14	0.72	0.28	0.00	29,818	0.19	0.50	0.09
Grantville	2000	1,309	0.10	0.67	0.32	0.01	29,797	0.13	0.55	0.06
Grayson	1980	478		1.00	0.00	0.00	48,967	0.08	0.55	0.06
Grayson	1990	543	0.11	1.00	0.00	0.00	54,210	0.03	0.81	0.17
Grayson	2000	765	0.17	0.91	0.06	0.01	53,303	0.08	0.83	0.24
Greenville	1980	1,213		0.36	0.63	0.00	22,145	0.29	0.38	0.11
Greenville	1990	1,167	0.34	0.25	0.75	0.00	21,285	0.32	0.51	0.11
Greenville	2000	946	0.32	0.24	0.76	0.00	25,867	0.26	0.60	0.15
Griffin	1980	20,728		0.57	0.43	0.00	27,835	0.23	0.43	0.12
Griffin	1990	21,738	0.62	0.51	0.48	0.01	29,072	0.23	0.56	0.14
Griffin	2000	23,451	0.48	0.46	0.49	0.01	30,991	0.21	0.64	0.16
Hampton	1980	2,059		0.75	0.25	0.00	37,684	0.15	0.53	0.08
Hampton	1990	2,629	0.16	0.80	0.19	0.00	38,037	0.15	0.73	0.07
Hampton	2000	3,857	0.08	0.84	0.14	0.01	47,477	0.05	0.74	0.11
Hapeville	1980	6,166		0.94	0.03	0.02	33,475	0.09	0.54	0.08
Hapeville	1990	5,486	0.13	0.76	0.10	0.10	34,562	0.12	0.58	0.13
Hapeville	2000	6,180	0.12	0.52	0.26	0.08	35,183	0.18	0.68	0.12
Haralson	1980	127		0.02	0.02	0.02	42,291	0.02	0.41	0.03
Haralson	1990	140	0.00	0.92	0.08	0.00	42,280	0.23	0.55	0.02
Haralson	2000	144	0.04	0.66	0.21	0.00	38,625	0.14	0.75	0.02
Hiram	1980	1,038		0.85	0.15	0.00	40,762	0.10	0.46	0.04
Hiram	1990	1,474	0.09	0.87	0.13	0.00	42,692	0.13	0.63	0.05
Hiram	2000	1,361	0.22	0.84	0.10	0.00	51,571	0.05	0.78	0.09
Holly Springs	1980	693		0.99	0.00	0.01	38,250	0.07	0.39	0.07

Continued on next page

Table 56 (continued)

Place	Year	Population	Live & Work[1]	White	Race Black	Asian	Median Income[2]	Poverty	Graduates HS[3]	BS[4]
Holly Springs	1990	2,684	0.06	0.98	0.00	0.00	55,511	0.04	0.81	0.14
Holly Springs	2000	3,195	0.04	0.94	0.01	0.01	58,730	0.01	0.82	0.14
Jackson	1980	4,133		0.56	0.44	0.00	28,760	0.18	0.46	0.09
Jackson	1990	4,441	0.44	0.56	0.44	0.00	33,677	0.14	0.55	0.09
Jackson	2000	3,934	0.41	0.56	0.43	0.01	29,326	0.21	0.69	0.12
Jasper	1980	1,553		0.92	0.07	0.00	26,709	0.19	0.43	0.15
Jasper	1990	1,982	0.41	0.96	0.03	0.00	27,754	0.16	0.60	0.11
Jasper	2000	2,167	0.49	0.92	0.06	0.00	32,902	0.16	0.67	0.15
Jenkinsburg	1980	332		0.18	0.18	0.18	43,032	0.18	0.26	0.03
Jenkinsburg	1990	213	0.02	0.87	0.12	0.00	52,125	0.19	0.62	0.07
Jenkinsburg	2000	203	0.16	0.68	0.28	0.02	41,630	0.14	0.71	0.08
Jonesboro	1980	4,132		0.80	0.20	0.00	39,847	0.13	0.47	0.09
Jonesboro	1990	4,166	0.19	0.78	0.21	0.00	31,073	0.26	0.57	0.09
Jonesboro	2000	3,829	0.17	0.59	0.34	0.01	32,910	0.20	0.71	0.13
Kennesaw	1980	5,095		0.98	0.02	0.01	47,587	0.04	0.65	0.10
Kennesaw	1990	9,118	0.12	0.97	0.03	0.00	51,202	0.06	0.83	0.20
Kennesaw	2000	21,675	0.15	0.81	0.11	0.03	62,216	0.05	0.91	0.34
Kingston	1980	733		0.62	0.38	0.00	27,946	0.15	0.25	0.03
Kingston	1990	608	0.11	0.61	0.39	0.00	30,233	0.21	0.49	0.04
Kingston	2000	659	0.10	0.69	0.30	0.00	27,895	0.15	0.56	0.05
Lake City	1980	2,963		0.92	0.08	0.00	49,102	0.07	0.63	0.08
Lake City	1990	2,819	0.06	0.87	0.12	0.01	49,790	0.03	0.71	0.07
Lake City	2000	2,886	0.09	0.57	0.24	0.11	40,097	0.09	0.71	0.08
Lawrenceville	1980	8,928		0.93	0.07	0.00	37,720	0.16	0.56	0.14
Lawrenceville	1990	17,410	0.28	0.91	0.06	0.02	48,408	0.09	0.75	0.21
Lawrenceville	2000	22,397	0.27	0.74	0.14	0.03	44,598	0.12	0.74	0.19
Lilburn	1980	3,765		0.98	0.01	0.01	59,146	0.03	0.75	0.18
Lilburn	1990	9,313	0.11	0.94	0.02	0.03	56,584	0.04	0.84	0.31

Continued on next page

Table 56 (continued)

Place	Year	Population	Live & Work[1]	Race White	Race Black	Race Asian	Median Income[2]	Poverty	Graduates HS[3]	Graduates BS[4]
Lilburn	2000	11,307	0.11	0.68	0.12	0.13	55,318	0.06	0.84	0.32
Lithonia	1980	2,637		0.56	0.44	0.00	20,063	0.31	0.40	0.04
Lithonia	1990	2,463	0.20	0.36	0.63	0.00	22,333	0.21	0.54	0.07
Lithonia	2000	2,187	0.09	0.17	0.77	0.01	24,099	0.26	0.67	0.08
Locust Grove	1980	1,479		0.81	0.18	0.01	35,787	0.14	0.41	0.03
Locust Grove	1990	1,677	0.13	0.86	0.14	0.00	44,868	0.05	0.57	0.07
Locust Grove	2000	2,322	0.10	0.80	0.17	0.00	43,454	0.09	0.72	0.09
Loganville	1980	1,862		0.92	0.08	0.00	36,303	0.13	0.39	0.05
Loganville	1990	3,237	0.13	0.93	0.04	0.02	38,311	0.10	0.65	0.10
Loganville	2000	5,435	0.14	0.90	0.04	0.02	49,329	0.07	0.84	0.16
Lone Oak	1980	123		0.18	0.18	0.18	26,709	0.18	0.52	0.10
Lone Oak	1990	161	0.00	0.79	0.21	0.00	30,502	0.05	0.66	0.10
Lone Oak	2000	104	0.12	0.79	0.12	0.00	37,338	0.00	0.73	0.09
Lovejoy	1980	212		0.11	0.11	0.11	42,086	0.11	0.45	0.04
Lovejoy	1990	757	0.11	0.57	0.42	0.00	49,085	0.08	0.61	0.05
Lovejoy	2000	2,495	0.05	0.64	0.33	0.00	41,343	0.12	0.67	0.04
Luthersville	1980	639		0.23	0.23	0.23	27,600	0.23	0.33	0.03
Luthersville	1990	741	0.11	0.54	0.46	0.00	28,444	0.26	0.44	0.05
Luthersville	2000	783	0.15	0.47	0.51	0.00	29,773	0.24	0.67	0.07
Manchester	1980	4,791		0.63	0.36	0.00	30,153	0.16	0.45	0.10
Manchester	1990	4,061	0.51	0.59	0.41	0.00	27,908	0.21	0.59	0.10
Manchester	2000	3,988	0.40	0.52	0.44	0.00	26,617	0.25	0.71	0.11
Mansfield	1980	465		0.17	0.17	0.17	24,297	0.17	0.37	0.04
Mansfield	1990	362	0.12	0.83	0.17	0.00	33,592	0.07	0.56	0.07
Mansfield	2000	392	0.07	0.81	0.19	0.00	35,192	0.10	0.67	0.07
Marietta	1980	30,829		0.83	0.16	0.01	36,101	0.13	0.64	0.22
Marietta	1990	45,475	0.34	0.76	0.20	0.02	38,046	0.14	0.81	0.28
Marietta	2000	58,748	0.29	0.56	0.30	0.02	41,864	0.16	0.82	0.34

Continued on next page

Table 56 (continued)

Place	Year	Population	Live & Work[1]	Race White	Black	Asian	Median Income[2]	Poverty	Graduates HS[3]	BS[4]
McDonough	1980	2,665		0.65	0.35	0.00	34,437	0.17	0.51	0.15
McDonough	1990	2,900	0.36	0.67	0.32	0.00	35,439	0.18	0.58	0.13
McDonough	2000	8,493	0.17	0.64	0.30	0.01	42,726	0.13	0.77	0.21
Meansville	1980	300		0.53	0.47	0.00	30,790	0.16	0.32	0.08
Meansville	1990	250	0.02	0.43	0.57	0.00	35,793	0.11	0.56	0.14
Meansville	2000	192	0.10	0.81	0.15	0.00	34,119	0.06	0.74	0.21
Milner	1980	343		0.78	0.22	0.00	23,889	0.22	0.58	0.17
Milner	1990	396	0.07	0.71	0.29	0.00	31,275	0.15	0.70	0.18
Milner	2000	522	0.07	0.70	0.29	0.01	43,489	0.07	0.71	0.09
Molena	1980	387		0.47	0.53	0.00	21,702	0.33	0.34	0.05
Molena	1990	439	0.11	0.67	0.33	0.00	28,958	0.18	0.45	0.02
Molena	2000	475	0.11	0.74	0.26	0.00	41,893	0.10	0.66	0.11
Monroe	1980	8,854		0.64	0.35	0.00	28,088	0.21	0.34	0.09
Monroe	1990	9,866	0.52	0.59	0.41	0.00	25,967	0.25	0.49	0.11
Monroe	2000	11,407	0.37	0.55	0.42	0.00	28,325	0.23	0.58	0.09
Monticello	1980	2,374		0.45	0.55	0.00	27,818	0.19	0.44	0.12
Monticello	1990	2,470	0.37	0.45	0.54	0.00	23,239	0.28	0.61	0.16
Monticello	2000	2,428	0.44	0.46	0.53	0.01	36,110	0.21	0.73	0.16
Moreland	1980	352		0.10	0.10	0.10	41,054	0.10	0.50	0.17
Moreland	1990	309	0.04	0.85	0.15	0.00	31,855	0.12	0.52	0.07
Moreland	2000	393	0.10	0.83	0.16	0.01	46,736	0.09	0.76	0.11
Morrow	1980	3,791		0.98	0.00	0.01	58,693	0.03	0.70	0.19
Morrow	1990	4,312	0.13	0.83	0.13	0.03	45,023	0.11	0.80	0.20
Morrow	2000	4,882	0.14	0.41	0.42	0.08	47,966	0.09	0.82	0.14
Mount Zion	1980	441		0.90	0.10	0.00	36,849	0.04	0.38	0.10
Mount Zion	1990	749	0.12	1.00	0.00	0.00	30,889	0.19	0.64	0.10
Mount Zion	2000	1,275	0.06	0.97	0.02	0.01	43,169	0.13	0.74	0.11
Mountain Park	1980	414		1.00	0.00	0.00	43,975	0.13	0.67	0.16

Continued on next page

Table 56 (continued)

Place	Year	Population	Live & Work[1]	White	Race Black	Asian	Median Income[2]	Poverty	Graduates HS[3]	BS[4]
Mountain Park	1990	532	0.07	0.99	0.01	0.00	54,249	0.06	0.91	0.32
Mountain Park	2000	506	0.04	0.98	0.00	0.02	57,551	0.04	0.92	0.34
Nelson	1980	559		0.92	0.08	0.00	23,423	0.07	0.27	0.01
Nelson	1990	467	0.09	0.90	0.09	0.00	30,178	0.10	0.42	0.03
Nelson	2000	626	0.02	0.92	0.07	0.00	45,578	0.04	0.69	0.20
Newborn	1980	384		0.21	0.21	0.21	39,073	0.21	0.38	0.06
Newborn	1990	404	0.04	0.74	0.26	0.00	36,874	0.18	0.60	0.10
Newborn	2000	520	0.12	0.67	0.29	0.02	38,823	0.11	0.73	0.14
Newnan	1980	11,499		0.56	0.44	0.00	28,282	0.23	0.45	0.13
Newnan	1990	12,691	0.57	0.51	0.48	0.00	29,180	0.24	0.61	0.17
Newnan	2000	16,242	0.41	0.56	0.41	0.01	37,226	0.20	0.73	0.22
Norcross	1980	3,317		0.89	0.11	0.00	41,168	0.08	0.67	0.14
Norcross	1990	5,458	0.18	0.74	0.19	0.05	46,380	0.07	0.77	0.21
Norcross	2000	8,410	0.16	0.51	0.23	0.08	46,070	0.18	0.68	0.23
Orchard Hill	1980	189		0.08	0.08	0.08	38,086	0.08	0.61	0.08
Orchard Hill	1990	245	0.05	1.00	0.00	0.00	35,039	0.08	0.51	0.07
Orchard Hill	2000	230	0.06	1.00	0.00	0.00	32,372	0.09	0.54	0.06
Oxford	1980	1,750		0.10	0.10	0.10	40,752	0.10	0.55	0.20
Oxford	1990	2,027	0.24	0.72	0.27	0.00	38,949	0.12	0.67	0.12
Oxford	2000	1,892	0.21	0.61	0.32	0.04	39,859	0.11	0.76	0.19
Palmetto	1980	2,072		0.64	0.35	0.00	32,319	0.15	0.45	0.05
Palmetto	1990	2,652	0.15	0.62	0.37	0.00	37,233	0.10	0.47	0.05
Palmetto	2000	3,400	0.10	0.47	0.45	0.01	33,255	0.11	0.62	0.07
Peachtree City	1980	6,429		0.99	0.01	0.00	68,032	0.02	0.93	0.27
Peachtree City	1990	18,993	0.35	0.93	0.04	0.03	74,384	0.02	0.94	0.38
Peachtree City	2000	31,580	0.32	0.88	0.06	0.04	78,752	0.02	0.96	0.46
Pine Lake	1980	901		0.99	0.00	0.01	29,575	0.13	0.53	0.07
Pine Lake	1990	810	0.04	0.95	0.03	0.00	36,329	0.10	0.68	0.08

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Table 56 (continued)

Place	Year	Population	Live & Work[1]	White	Race Black	Asian	Median Income[2]	Poverty	Graduates HS[3]	BS[4]
Pine Lake	2000	621	0.10	0.75	0.17	0.01	42,260	0.16	0.88	0.37
Porterdale	1980	1,451		0.16	0.16	0.16	27,913	0.16	0.18	0.02
Porterdale	1990	1,278	0.06	0.99	0.00	0.00	24,029	0.22	0.34	0.04
Porterdale	2000	1,281	0.07	0.91	0.05	0.01	24,686	0.22	0.42	0.03
Powder Springs	1980	3,381		0.93	0.07	0.00	47,455	0.07	0.59	0.04
Powder Springs	1990	6,907	0.09	0.83	0.15	0.00	56,984	0.04	0.77	0.19
Powder Springs	2000	12,481	0.10	0.59	0.37	0.01	58,181	0.08	0.87	0.29
Riverdale	1980	7,121		0.98	0.01	0.01	43,949	0.07	0.71	0.11
Riverdale	1990	9,852	0.10	0.72	0.24	0.03	47,071	0.07	0.79	0.13
Riverdale	2000	12,478	0.11	0.21	0.63	0.08	40,716	0.13	0.77	0.15
Roopville	1980	212		0.09	0.09	0.09	28,762	0.09	0.49	0.16
Roopville	1990	263	0.05	0.90	0.10	0.00	29,538	0.24	0.66	0.16
Roopville	2000	177	0.08	0.85	0.15	0.00	33,905	0.17	0.76	0.20
Roswell	1980	23,337		0.98	0.01	0.01	66,096	0.04	0.84	0.35
Roswell	1990	48,834	0.24	0.92	0.05	0.02	72,565	0.03	0.92	0.46
Roswell	2000	79,334	0.24	0.82	0.08	0.04	73,878	0.05	0.93	0.53
Sandy Springs	1980	46,877		0.04	0.04	0.04	62,827	0.04	0.93	0.48
Sandy Springs	1990	67,842	0.23	0.90	0.08	0.02	62,864	0.05	0.96	0.53
Sandy Springs	2000	85,524	0.24	0.77	0.12	0.03	62,241	0.06	0.94	0.60
Senoia	1980	896		0.59	0.41	0.00	33,210	0.20	0.36	0.08
Senoia	1990	971	0.20	0.66	0.33	0.00	37,305	0.18	0.52	0.11
Senoia	2000	1,738	0.10	0.78	0.20	0.01	51,592	0.07	0.80	0.20
Shady Dale	1980	167		0.10	0.10	0.10	29,677	0.10	0.37	0.08
Shady Dale	1990	162	0.10	0.69	0.31	0.00	33,881	0.11	0.57	0.05
Shady Dale	2000	242	0.11	0.59	0.34	0.00	36,533	0.15	0.61	0.03
Sharpsburg	1980	204		0.12	0.12	0.12	31,457	0.12	0.40	0.12
Sharpsburg	1990	202	0.09	0.87	0.13	0.00	34,750	0.14	0.56	0.03
Sharpsburg	2000	316	0.03	0.97	0.02	0.00	56,650	0.02	0.80	0.19

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Table 56 (continued)

Place	Year	Population	Live & Work[1]	White	Race Black	Asian	Median Income[2]	Poverty	Graduates HS[3]	BS[4]
Smyrna	1980	20,312		0.96	0.03	0.01	45,226	0.06	0.72	0.19
Smyrna	1990	33,510	0.18	0.80	0.16	0.02	47,070	0.07	0.85	0.34
Smyrna	2000	40,999	0.14	0.60	0.27	0.04	48,999	0.09	0.86	0.40
Snellville	1980	8,514		0.99	0.00	0.00	64,862	0.02	0.79	0.21
Snellville	1990	12,293	0.21	0.99	0.00	0.00	65,156	0.03	0.88	0.22
Snellville	2000	15,351	0.18	0.90	0.06	0.01	69,746	0.03	0.91	0.29
Social Circle	1980	2,591		0.60	0.40	0.00	31,966	0.19	0.28	0.07
Social Circle	1990	2,755	0.38	0.55	0.44	0.00	37,779	0.10	0.53	0.08
Social Circle	2000	3,379	0.35	0.56	0.42	0.00	36,414	0.14	0.65	0.14
Statham	1980	1,134		0.85	0.15	0.00	29,418	0.11	0.36	0.06
Statham	1990	1,397	0.20	0.78	0.22	0.00	35,419	0.21	0.47	0.05
Statham	2000	2,040	0.09	0.80	0.17	0.01	41,314	0.13	0.66	0.09
Stockbridge	1980	2,096		0.84	0.16	0.00	45,384	0.17	0.49	0.09
Stockbridge	1990	3,997	0.17	0.90	0.09	0.00	42,620	0.05	0.73	0.10
Stockbridge	2000	9,853	0.11	0.73	0.19	0.04	49,745	0.07	0.85	0.24
Stone Mountain	1980	4,867		0.85	0.14	0.01	43,931	0.08	0.70	0.25
Stone Mountain	1990	5,675	0.09	0.73	0.23	0.02	48,422	0.07	0.80	0.27
Stone Mountain	2000	7,145	0.07	0.30	0.66	0.01	39,761	0.12	0.80	0.21
Sugar Hill	1980	2,318		1.00	0.00	0.00	44,971	0.09	0.53	0.11
Sugar Hill	1990	4,762	0.08	0.99	0.00	0.00	53,262	0.08	0.70	0.16
Sugar Hill	2000	11,399	0.10	0.88	0.06	0.01	61,274	0.03	0.83	0.28
Sunny Side	1980	364		0.15	0.15	0.15	23,316	0.15	0.59	0.13
Sunny Side	1990	209	0.04	1.00	0.00	0.00	28,380	0.12	0.77	0.18
Sunny Side	2000	142	0.25	1.00	0.00	0.00	27,895	0.13	0.82	0.20
Suwanee	1980	1,026		0.89	0.11	0.00	46,234	0.13	0.51	0.05
Suwanee	1990	2,492	0.14	0.96	0.02	0.02	67,763	0.02	0.78	0.27
Suwanee	2000	8,725	0.14	0.83	0.06	0.07	86,559	0.02	0.93	0.46
Talking Rock	1980	79		0.35	0.35	0.35	15,432	0.35	0.00	0.00

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Table 56 (continued)

Place	Year	Population	Live & Work[1]	Race White	Race Black	Race Asian	Median Income[2]	Poverty	Graduates HS[3]	Graduates BS[4]
Talking Rock	1990	62	0.00	1.00	0.00	0.00	28,669	0.31	0.62	0.08
Talking Rock	2000	49	0.00	1.00	0.00	0.00	34,333	0.00	0.48	0.00
Tallapoosa	1980	2,647		0.90	0.09	0.00	27,169	0.17	0.39	0.06
Tallapoosa	1990	2,706	0.42	0.90	0.09	0.00	25,566	0.23	0.52	0.11
Tallapoosa	2000	2,789	0.33	0.93	0.04	0.00	30,836	0.19	0.69	0.13
Temple	1980	1,519		0.86	0.14	0.00	30,331	0.12	0.40	0.07
Temple	1990	1,845	0.14	0.88	0.11	0.00	33,334	0.23	0.60	0.07
Temple	2000	2,383	0.12	0.87	0.12	0.00	40,235	0.08	0.68	0.07
Turin	1980	263		0.11	0.11	0.11	33,388	0.11	0.36	0.04
Turin	1990	179	0.11	0.80	0.20	0.00	39,383	0.05	0.58	0.05
Turin	2000	165	0.05	0.82	0.18	0.00	51,500	0.07	0.83	0.16
Tyrone	1980	1,038		0.05	0.05	0.05	52,650	0.05	0.59	0.07
Tyrone	1990	2,911	0.14	0.98	0.01	0.01	66,242	0.02	0.79	0.15
Tyrone	2000	3,916	0.12	0.95	0.03	0.01	64,972	0.01	0.89	0.30
Union City	1980	4,780		0.81	0.18	0.00	42,024	0.08	0.59	0.08
Union City	1990	8,991	0.10	0.48	0.51	0.01	37,968	0.09	0.76	0.17
Union City	2000	11,621	0.11	0.26	0.67	0.01	36,382	0.12	0.77	0.19
Villa Rica	1980	3,424		0.73	0.27	0.00	27,466	0.18	0.33	0.05
Villa Rica	1990	3,916	0.35	0.84	0.16	0.00	31,137	0.19	0.46	0.05
Villa Rica	2000	4,134	0.34	0.80	0.18	0.00	32,096	0.13	0.56	0.08
Waco	1980	476		0.99	0.01	0.00	30,246	0.12	0.31	0.02
Waco	1990	465	0.06	0.96	0.04	0.00	38,550	0.11	0.48	0.06
Waco	2000	469	0.09	0.98	0.01	0.00	32,617	0.13	0.67	0.07
Waleska	1980	466		0.94	0.02	0.04	29,677	0.17	0.57	0.19
Waleska	1990	635	0.41	0.97	0.00	0.03	36,488	0.11	0.60	0.20
Waleska	2000	616	0.32	0.90	0.03	0.03	47,453	0.05	0.81	0.35
Walnut Grove	1980	395		0.19	0.19	0.19	32,942	0.19	0.44	0.04
Walnut Grove	1990	521	0.04	0.92	0.07	0.00	36,835	0.07	0.50	0.09

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Table 56 (continued)

Place	Year	Population	Live & Work[1]	Race White	Race Black	Race Asian	Median Income[2]	Poverty	Graduates HS[3]	Graduates BS[4]
Walnut Grove	2000	1,241	0.07	0.94	0.02	0.02	56,098	0.07	0.78	0.16
Warm Springs	1980	434		0.73	0.27	0.00	20,985	0.22	0.42	0.05
Warm Springs	1990	402	0.28	0.79	0.18	0.02	33,136	0.19	0.71	0.15
Warm Springs	2000	485	0.28	0.59	0.37	0.01	30,256	0.16	0.64	0.12
White	1980	505		0.13	0.13	0.13	29,183	0.13	0.30	0.03
White	1990	551	0.11	1.00	0.00	0.00	29,075	0.15	0.40	0.03
White	2000	693	0.07	0.92	0.02	0.00	32,402	0.15	0.55	0.04
Whitesburg	1980	792		0.23	0.23	0.23	26,072	0.23	0.38	0.04
Whitesburg	1990	686	0.14	0.78	0.22	0.00	30,841	0.22	0.46	0.03
Whitesburg	2000	596	0.11	0.78	0.20	0.00	27,553	0.19	0.50	0.07
Williamson	1980	262		0.18	0.18	0.18	35,118	0.18	0.36	0.00
Williamson	1990	295	0.10	0.97	0.03	0.00	42,916	0.01	0.66	0.06
Williamson	2000	297	0.12	0.81	0.18	0.00	35,753	0.17	0.67	0.12
Winder	1980	6,705		0.82	0.18	0.00	29,821	0.22	0.42	0.11
Winder	1990	7,502	0.47	0.83	0.16	0.01	31,368	0.20	0.61	0.15
Winder	2000	10,201	0.34	0.77	0.21	0.01	37,002	0.13	0.70	0.14
Woodbury	1980	1,771		0.24	0.24	0.24	26,769	0.24	0.36	0.06
Woodbury	1990	1,429	0.37	0.40	0.59	0.00	27,017	0.27	0.55	0.08
Woodbury	2000	1,184	0.19	0.39	0.61	0.00	27,129	0.25	0.57	0.09
Woodstock	1980	2,699		0.94	0.05	0.00	51,117	0.06	0.66	0.11
Woodstock	1990	4,749	0.19	0.94	0.04	0.01	49,378	0.04	0.79	0.15
Woodstock	2000	10,050	0.17	0.90	0.03	0.02	60,261	0.04	0.86	0.34
Woolsey	1980	113		0.12	0.12	0.12	33,634	0.12	0.58	0.15
Woolsey	1990	190	0.00	0.98	0.00	0.02	41,120	0.00	0.74	0.24
Woolsey	2000	175	0.05	1.00	0.00	0.00	86,626	0.03	0.94	0.28
Zebulon	1980	983		0.53	0.47	0.00	29,171	0.11	0.46	0.15
Zebulon	1990	1,035	0.34	0.60	0.39	0.00	29,661	0.21	0.60	0.09
Zebulon	2000	1,181	0.24	0.56	0.40	0.01	29,999	0.15	0.72	0.10

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Table 56 (continued)

Place	Year	Population	Live & Work[1]	White	Race Black	Asian	Median Income[2]	Poverty	Graduates HS[3]	BS[4]

1. Live & work is the portion of the population living and working in the same place
2. Median income is median household income for the jurisdiction in year 2000 USD
3. HS graduates includes high school diploma or equivalent
4. BS graduates includes all graduates with a 4 year degree or more

Live & work, race, and graduates are reported as portions of population (>16,all,>25)

APPENDIX B

DEVELOPMENT DETAILED DATA

B.1 GPI Method Summary

This appendix summarizes the equations and variables used in calculating the GPI for this dissertation. Equations for each sub-measure are given, by dimension in Table 57. Definitions of the variables used in these equations are then given in Table 58. This compilation is provided for convenient reference; for most sub-measures, greater detail can be found in Section 5.2.

Table 57: Sub-measures and their formulas, by dimension

	Sub-measure	Formula
		Economic dimension
A	Income	$PI_{i,t}$
B	Inequality	$IG_{I,t}$
C	Adjusted Income	$PI_{i,t} \times (1 - IG_{i,t})$
D	Household	$WM_{i,t} \sum_{j=1}^{4} HL_{j,t} * p_{i,t,j}$
E	Volunteer	$\sum p_{i,j,t} \times PV_j \times HV_j$
K	Underemployment	$\frac{UH_{n,t}}{NW_{n,t}} \times NUE_{i,t} \times W_{i,t}$
		Social dimension
H	Crime	$\sum_{7}^{v=1} TCCr_v \times RCr_{v,t} \times pi, t$
I	Family breakdown	$\left(CD + CDPC \times \left(\frac{Ch}{D}\right)_{i,t} \times \left(\frac{MW}{MW+MWo}\right)_{i,t}\right) \times DR_{i,t} \times p_{i,t}$
J	Loss of leisure	$W_{i,t} \times \left[DHW_{i,t=1980} - \left(DHW_{tot} - \frac{HWagg_{i,t}}{NW_{i,t}}\right) \times NW_{i,t}\right]$
O	Car accidents	$\sum_{3}^{j=1} NAA_{i,j,t} \times CPAA_j$
M	Commuting	$AHC_{i,t} \times HCC_{i,t}$
		$AHC_{i,t} = \frac{2(trips)}{1(day)} \times \frac{250(days)}{1(year)} \times \frac{1(hour)}{60(minutes)} * AMW_{i,t}$
		$AMW_{i,t} = \sum_{a=1}^{n} MW_a \times p_{i,t,a}$
	Health	life expectancy
	Education	basic literacy
		Environment dimension
N	Pollution abatement	$CVPA_{i,t} + CWW_{i,t} + CSW_{i,t}$
		$CVPA_{i,t} = NNVR_{i,t} \times \$108.50$
		$CWW_{i,t} = p_{i,t}\left(\sum_{t+5}^{k=t} PEWW_{i,k}/p_{i,k}\right)$
		$CSW_{i,t} = CPSWD_i \times p_{i,t} \times PSW_i$
Q	Air pollution	$\frac{PSII_{i,t}}{PSII_{i,t=2000}} \times p_{i,t=2000} \times \frac{CAP_{n,t=2000}}{p_{n,t=2000}}$
P	Water pollution	$(PCVCW \times (1 - PSWDU_{i,t})) \times p_{i,t}$
R	Noise pollution	$\frac{up_{i,t}}{up_{n,t}} \times CNP_{n,t}$"
V	Long-term damage	$\$2.56 \times TNRE_{i,t} + HYTCB_{i,t} \times \frac{BOE}{1.8\times10^{-7} BTU}$
		Resources dimension
L	Durable goods cost	$PC_{i,t} \times PCD_{a,t}$
F	Durable goods service	$DR \times \frac{API_{i,t}}{API_{n,t}} \times NCD_{n,t}$
G	Roads	$FS \times \frac{VSH_{n,t}}{MSH_{n,t}} \times MSH_{i,t}$"
Y	Net capital investment	$CI_{i,t} - \left(\frac{CI_{i,t-1}}{NW_{i,t-1}}\right) \times NW_{i,t}$
T	Farm land	$VFm_{i,t} \times (FmL_{i,t-1} - FmL_{i,t})$
S	Wetland	$VWL \times (WL_{i,t=1974} - WL_{i,t})$
X	Forest land	$VFL \times (FL_{i,t=1974} - FL_{i,t})$
U	Non-renewable resources	$TNRE_{i,t} \times \frac{\$109.71}{barrel} \times \frac{BOE}{1.8\times10^{-7} BTU}$
W	Ozone depletion	$\frac{\$49669 \times GP_t}{p_{n,t}} \times p_{i,t}$

a. Types of crime: Murder and non-negligent manslaughter, forcible rape, robbery, aggravated assault, burglary, larceny-theft, and motor vehicle theft

b. Types of accidents: fatal, non-fatal injury, property damage only

Table 58: Variables in GPI Sub-Measure Equations

Variable	Meaning	Source
$AMW_{i,t}$	Aggregate minutes to work in place i at time t	Mean minutes to work span and people with a commute within a span based on tables of travel time to work for workers 16 years and older from: U.S. Census 1980, Missouri Census Data Center stf803x2 and U.S. Census 2000, SF3, P31. For 1990, the aggregate travel time to work in minutes is used from U.S. Census 1990, STF3, P051. In 2000, there were twelve travel time to work spans reported, ranging from less than five minutes to greater than ninety minutes. For each time span, the average was used as the travel time for all workers in the span, with the exception of the end points. For less than five minutes, a time of 2.5 minutes was used while for greater than ninety minutes, ninety minutes was used. This method could bias the results if the internal time spans did not have a normal distribution or there were much longer commute times than ninety minutes for the higher end group.
CD	Cost per divorce	$13,380 Anielski and Rowe (1999); Costanza et al. (2004)
$CDPC$	Cost per divorce per child	$8922 Anielski and Rowe (1999); Costanza et al. (2004)
$\left(\frac{Ch}{D}\right)_{i,t}$	Number of children per divorce in place i at time t	National Center for Health Statistics (1983, 1995)
$CI_{i,t}$	Capital investment in place i at time t	National stock of nonresidential capital at the end of the year from Bureau of Economic Analysis (2010b). Unfortunately, more localized data could not be identified, and this number is population weighted to local areas. As such, areas with more or less investment than the national average will not be properly represented by this estimate.
$CNP_{n,t}$	Cost of noise pollution, nationally, at time t	Scaled from the value of $14.6 Billion USD based on an improvement of one percent per year
$CPAA_j$	Tangible cost per accident of type j	National Safety Council (2010)
$CPSWD_i$	Cost per pound of solid waste disposal in place i	State level estimate from Georgia Department of Community Affairs (2001)

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Table 58 (continued)

Variable	Meaning	Source
$DHW_{i,t}$	Discretionary hours per worker in place i at time t	Calculated as difference between constant DH_{tot} of 3650 hours and hours worked
$FL_{i,t}$	Acres of forest land in place i at time t	Natural Resources Spatial Analysis Laboratory (NARSAL) (2010)
$FmL_{i,t}$	Acres of farm land in place i at time t	U.S. Department of Agriculture (2007)
GP_t	Global production of chlorofluorocarbons at time t	Alternative Fluorocarbons Environmental Acceptability Study (2009)
$HCC_{i,t}$	Hourly cost of commuting in place i at time t	2/3 wage rate $W_{i,t}$
$HL_{j,t}$	Hours of household labor per year by group j at time t	Forecasted using Ramey (2009) data
HV_j	Median hours volunteered by an education class j for those who volunteer per year	(Office of Research and Policy Development, 2007)
$HWagg_{i,t}$	Aggregate hours worked in place i at time t	Sex by work status by usual hours worked by weeks worked for the population 16 years and older; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991, P076), & U.S. Bureau of the Census (2001b, P47)
$HYTCB_{i,t}$	Hydroelectric energy production in place i at time t	State level estimates from Energy Information Administration (2010)
$IG_{i,t}$	Gini coefficient for income in place i at time t	Household income; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991, P080), & U.S. Bureau of the Census (2001b, P52)
$MSH_{i,t}$	Miles of streets and highways in place i at time t	Bureau of Transportation Statistics (2002); Georgia Department of Transportation (1980, 1989, 2000)
$\left(\frac{MW}{MW+MWo}\right)_{i,t}$	Portion of married families with children under the age of 18 in place i at time t	Household size by household type and presence of own children; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991), & U.S. Bureau of the Census (2001b, P10)
$NAA_{i,j,t}$	Number of accidents of type j in place i at time t	County data for 2000 from Georgia Department of Transportation (2006); other years imputed based on road mileage and population
$NCD_{n,t}$	Net national stock of consumer durables at time t	Bureau of Economic Analysis (2010a)

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Table 58 (continued)

Variable	Meaning	Source
$NNVR_{i,t}$	Number of new vehicle registrations in place i at time t	Federal Highway Administration (2003)
$NUE_{i,t}$	Number of underemployed in place i at time t	Sex by employment status; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991, P070), & U.S. Bureau of the Census (2001b, P43)
$NW_{i,t}$	Number of workers in place i at time t	Sex by employment status; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991, P070), & U.S. Bureau of the Census (2001b, P43)
$p_{i,j,t}$	Population in an education class j in place i at time t	Educational attainment for population 25 years and older; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991, P057), & U.S. Bureau of the Census (2001b, P37)
$p_{i,t,j}$	Population in sex/labor group j in place i at time t	Sex by employment status; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991, P070), & U.S. Bureau of the Census (2001b, P43)
pi,t	Population in place i at time t	Total population; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991, P1), & U.S. Bureau of the Census (2001b, P1)
$PCD_{a,t}$	Portion of expenditure on consumer durables in Atlanta at time t	Bureau of Economic Analysis (2010b)
$PCVCW$	Per capita value of clean water	Per capita value of clean water is $84.59 YR2000 USD derived from Freeman (1982) and Talberth et al. (2007)
$PEWW_{i,t}$	Public expenditure on water and wastewater in place i at time t	Local government expenditures on water and sewer current operations are from block 550 of the Georgia Department of Community Affairs local government finances survey. Because not every government responds each year, an average for five years of expenditure are used: 1990-1994 and 2000-2004 for 1990 and 2000, respectively. Data were not available for 1980, so 1990 expenditures per capita are used in 1980.
$PI_{i,t}$	Aggregate personal income in place i at time t	Per capita income; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991, P114A), & U.S. Bureau of the Census (2001b, P82)

Continued on next page

Table 58 (continued)

Variable	Meaning	Source
$PSII_{i,t}$	Index of average yearly PSI in place i at time t with PSI index for 2000 set to equal 100	U.S. Environmental Protection Agency (2008)
PSW_i	Pounds of solid waste generated per person in place i	State level estimate from Georgia Department of Community Affairs (2001)
$PSWDU_{i,t}$	Percent of waters tested supporting their designated use in place i at time t	Detailed tabular water quality data acquired via personal communication with Susan Salter of the Georgia Department of Natural Resources; see also Georgia Environmental Protection Division (2002)
$PV_{j,t}$	Percent of an education class j who volunteer, on average, at time t	(Hayghe, 1991; Office of Research and Policy Development, 2007)
RCr_v	Rate of crime of type v at time t	Federal Bureau of Investigations (2000)
$TCCr_v$	Tangible costs of crime of type v	Miller et al. (1996)
$TNRE_{i,t}$	Total non-renewable energy consumption in place i at time t	State level estimates from Energy Information Administration (2010)
$UH_{n,t}$	Unprovided hours, nationally, at time t	Imputed from Leete-Guy and Schor (1992)
$up_{i,t}$	Urban population in place i at time t	Urban and rural population; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991, P006), & U.S. Bureau of the Census (2001b, P5)
VFL	Value of forest land per acre	\$481 YR2000 USD per acre (Costanza et al., 2004)
VFm	Value of farm land per acre in place i at time t	per acre value varies U.S. Department of Agriculture (2007)
$VSH_{n,t}$	Value of stock of streets and highways for nation at time t	Bureau of Economic Analysis (2010b, Table 5.8.5A. Gross Government Fixed Investment by Type)
VWL	Value of wetlands per acre	\$6781 YR2000 USD per acre (Costanza et al., 2004)
$W_{i,t}$	Average wage in place i at time t	Wage or salary income; Missouri Census Data Center (2007), U.S. Bureau of the Census (1991, P090), & U.S. Bureau of the Census (2001b, P59)
$WL_{i,t}$	Acres of wetlands in place i at time t	Natural Resources Spatial Analysis Laboratory (NARSAL) (2010)

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Table 58 (continued)

Variable	Meaning	Source
$WM_{i,t}$	Wage of maid in place i at time t	Bureau of Labor Statistics (1999)

B.2 GPI Detailed Data

B.2.1 Counties

Table 59: GPI Sub-measures by County, A-M

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Barrow	1980	10,367	0.40	6,245	7,040	76	1,711	8	-319	-127	0	-286	-1,967	-603
Barrow	1990	19,883	0.40	11,921	7,143	90	1,755	10	-319	-112	-691	-574	-1,596	-781
Barrow	2000	24,453	0.39	15,024	7,113	129	2,126	10	-319	-43	-1,420	-782	-2,001	-1,303
Bartow	1980	10,164	0.37	6,411	6,838	75	1,677	9	-319	-127	0	-402	-1,928	-555
Bartow	1990	20,605	0.40	12,392	7,095	89	1,819	11	-319	-112	-698	-722	-1,654	-762
Bartow	2000	27,371	0.40	16,321	7,178	133	2,379	12	-319	-49	-1,514	-701	-2,240	-642
Butts	1980	9,936	0.40	6,006	7,084	75	1,640	11	-150	-127	0	-318	-1,885	-675
Butts	1990	17,631	0.44	9,873	7,333	89	1,556	16	-150	-112	-535	-584	-1,415	-696
Butts	2000	22,708	0.40	13,640	7,549	126	1,974	17	-150	-52	-1,442	-573	-1,859	-555
Carroll	1980	10,293	0.39	6,257	7,184	82	1,699	8	-319	-127	0	-466	-1,953	-568
Carroll	1990	19,699	0.42	11,383	7,310	91	1,739	11	-319	-112	-744	-566	-1,581	-698
Carroll	2000	22,727	0.44	12,687	7,534	128	1,976	12	-319	-55	-1,376	-827	-1,860	-509
Cherokee	1980	11,859	0.35	7,685	6,593	86	1,957	6	-319	-127	0	-286	-2,250	-941
Cherokee	1990	23,449	0.35	15,232	6,717	116	2,070	7	-319	-112	-659	-471	-1,882	-1,106
Cherokee	2000	32,973	0.37	20,769	6,891	166	2,866	7	-319	-43	-1,359	-534	-2,699	-891
Clayton	1980	12,864	0.32	8,706	6,530	93	2,123	2	-319	-127	0	-401	-2,441	-816
Clayton	1990	23,238	0.35	15,039	6,870	110	2,051	3	-319	-112	-739	-667	-1,865	-848
Clayton	2000	22,696	0.38	14,041	6,942	138	1,973	3	-319	-51	-1,429	-1,016	-1,858	-543
Cobb	1980	15,703	0.35	10,179	6,729	121	2,592	2	-319	-127	0	-285	-2,979	-1,044
Cobb	1990	31,132	0.39	19,112	6,960	146	2,748	3	-319	-112	-978	-523	-2,499	-1,266
Cobb	2000	38,316	0.41	22,775	7,184	191	3,331	4	-319	-49	-1,854	-778	-3,136	-949
Coweta	1980	11,587	0.42	6,677	7,047	85	1,912	8	-319	-127	0	-440	-2,198	-695
Coweta	1990	23,198	0.43	13,303	7,078	101	2,047	11	-319	-112	-858	-556	-1,862	-867
Coweta	2000	28,405	0.39	17,287	7,025	151	2,469	10	-319	-41	-1,592	-682	-2,325	-670
Dawson	1980	9,926	0.40	5,939	7,011	72	1,638	23	-150	-127	0	-324	-1,883	-684
Dawson	1990	20,640	0.40	12,310	6,988	92	1,822	22	-150	-112	-789	-479	-1,657	-985
Dawson	2000	28,176	0.42	16,395	7,209	153	2,449	17	-150	-39	-1,697	-648	-2,306	-746

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Table 59 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
DeKalb	1980	14,920	0.38	9,198	6,995	132	2,462	1	-319	-127	0	-372	-2,831	-967
DeKalb	1990	29,610	0.41	17,370	7,252	145	2,613	2	-319	-112	-1,170	-722	-2,377	-1,133
DeKalb	2000	33,648	0.42	19,399	7,455	182	2,925	3	-319	-55	-2,063	-1,107	-2,754	-832
Douglas	1980	11,916	0.32	8,124	6,522	86	1,967	4	-319	-127	0	-339	-2,261	-896
Douglas	1990	22,165	0.34	14,591	6,835	102	1,956	6	-319	-112	-739	-577	-1,779	-937
Douglas	2000	27,605	0.38	17,144	7,145	149	2,400	7	-319	-52	-1,417	-733	-2,259	-721
Fayette	1980	16,009	0.34	10,504	6,495	113	2,642	6	-319	-127	0	-249	-3,037	-1,119
Fayette	1990	30,142	0.35	19,568	6,806	133	2,660	5	-319	-112	-902	-350	-2,419	-1,215
Fayette	2000	38,713	0.38	24,167	7,125	189	3,365	7	-319	-46	-1,752	-511	-3,169	-946
Forsyth	1980	12,171	0.39	7,481	6,759	85	2,009	8	-319	-127	0	-257	-2,309	-953
Forsyth	1990	25,807	0.39	15,641	7,058	108	2,278	9	-319	-112	-787	-442	-2,071	-1,074
Forsyth	2000	37,899	0.40	22,795	6,835	181	3,295	7	-319	-30	-1,625	-390	-3,102	-982
Fulton	1980	15,234	0.47	8,082	7,464	119	2,514	2	-319	-127	0	-512	-2,891	-1,022
Fulton	1990	36,118	0.53	16,971	7,511	137	3,188	3	-319	-112	-1,450	-787	-2,899	-1,353
Fulton	2000	48,110	0.53	22,772	7,621	187	4,182	3	-319	-53	-3,312	-1,741	-3,938	-1,080
Gwinnett	1980	14,859	0.32	10,072	6,343	113	2,452	3	-319	-127	0	-244	-2,819	-1,020
Gwinnett	1990	28,982	0.35	18,966	6,551	138	2,558	3	-319	-112	-793	-408	-2,326	-1,151
Gwinnett	2000	33,376	0.37	21,048	6,891	177	2,901	4	-319	-40	-1,513	-641	-2,732	-851
Haralson	1980	10,410	0.40	6,256	7,218	80	1,718	12	-150	-127	0	-507	-1,975	-568
Haralson	1990	18,597	0.40	11,143	7,561	88	1,641	19	-150	-112	-724	-469	-1,493	-712
Haralson	2000	22,026	0.45	12,215	7,699	118	1,915	21	-150	-57	-1,152	-699	-1,803	-536
Heard	1980	8,885	0.39	5,427	7,128	71	1,466	24	-150	-127	0	-484	-1,686	-618
Heard	1990	15,889	0.42	9,243	7,325	77	1,402	32	-150	-112	-555	-497	-1,275	-671
Heard	2000	19,429	0.42	11,210	7,350	114	1,689	32	-150	-53	-1,296	-916	-1,590	-554
Henry	1980	12,844	0.36	8,239	6,881	90	2,120	8	-319	-127	0	-311	-2,437	-967
Henry	1990	23,114	0.35	15,074	6,881	104	2,040	9	-319	-112	-793	-489	-1,855	-978
Henry	2000	28,515	0.35	18,441	6,872	151	2,479	7	-319	-33	-1,591	-496	-2,334	-752
Jasper	1980	10,287	0.41	6,042	7,456	81	1,698	28	-150	-127	0	-347	-1,952	-716
Jasper	1990	19,231	0.43	10,984	7,306	98	1,697	43	-150	-112	-761	-727	-1,544	-821

Continued on next page

Table 59 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Jasper	2000	22,942	0.47	12,239	7,499	130	1,994	42	-150	-50	-1,409	-807	-1,878	-603
Lamar	1980	10,122	0.39	6,157	7,368	83	1,670	12	-150	-127	0	-596	-1,921	-581
Lamar	1990	17,592	0.42	10,194	7,624	91	1,553	19	-150	-112	-664	-626	-1,412	-649
Lamar	2000	21,982	0.43	12,562	7,735	129	1,911	20	-150	-55	-1,315	-935	-1,799	-483
Meriwether	1980	8,701	0.42	5,089	7,102	74	1,436	14	-150	-127	0	-328	-1,651	-484
Meriwether	1990	15,708	0.44	8,809	7,461	80	1,386	24	-150	-112	-551	-865	-1,261	-587
Meriwether	2000	21,473	0.46	11,491	7,734	122	1,867	30	-150	-67	-1,321	-1,107	-1,758	-512
Newton	1980	10,749	0.37	6,803	6,917	78	1,774	7	-319	-127	0	-438	-2,039	-674
Newton	1990	20,092	0.41	11,823	7,304	89	1,773	11	-319	-112	-775	-693	-1,613	-738
Newton	2000	24,775	0.39	15,008	7,279	134	2,154	11	-319	-45	-1,509	-890	-2,028	-603
Paulding	1980	10,151	0.38	6,343	6,878	71	1,675	8	-319	-127	0	-386	-1,926	-868
Paulding	1990	19,559	0.35	12,810	6,859	88	1,726	10	-319	-112	-731	-536	-1,570	-971
Paulding	2000	24,990	0.34	16,587	6,649	136	2,172	8	-319	-34	-1,445	-463	-2,045	-781
Pickens	1980	10,061	0.41	5,936	7,434	79	1,660	13	-319	-127	0	-340	-1,909	-670
Pickens	1990	21,595	0.42	12,420	7,461	92	1,906	20	-319	-112	-543	-551	-1,733	-833
Pickens	2000	27,775	0.40	16,574	7,604	142	2,414	16	-319	-42	-1,363	-391	-2,273	-716
Pike	1980	10,248	0.38	6,335	7,017	85	1,691	17	-150	-127	0	-315	-1,945	-689
Pike	1990	19,639	0.41	11,526	7,321	96	1,733	25	-150	-112	-776	-510	-1,576	-866
Pike	2000	23,406	0.39	14,218	7,266	134	2,035	24	-150	-50	-1,307	-545	-1,916	-573
Rockdale	1980	13,469	0.34	8,910	6,674	98	2,223	4	-319	-127	0	-300	-2,556	-975
Rockdale	1990	25,422	0.38	15,688	6,829	115	2,244	6	-319	-112	-651	-451	-2,040	-1,034
Rockdale	2000	29,133	0.39	17,726	7,286	158	2,533	6	-319	-52	-1,502	-775	-2,384	-697
Spalding	1980	10,721	0.40	6,458	7,045	82	1,769	5	-319	-127	0	-455	-2,034	-581
Spalding	1990	19,845	0.42	11,528	7,277	93	1,752	7	-319	-112	-693	-679	-1,593	-697
Spalding	2000	23,640	0.43	13,571	7,595	126	2,055	9	-319	-63	-1,429	-1,022	-1,935	-521
Walton	1980	10,025	0.40	6,037	6,875	73	1,654	9	-319	-127	0	-343	-1,902	-643
Walton	1990	20,218	0.43	11,551	7,211	90	1,784	13	-319	-112	-683	-512	-1,623	-864
Walton	2000	24,609	0.40	14,791	7,119	131	2,139	12	-319	-42	-1,322	-592	-2,014	-652

Column headings refer to GPI alphabetical organization, see Section 5.2

Table 60: GPI Sub-measures by County, N-Y and Overall

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Barrow	1980	-50	-1,095	-65	-134	0	-7	-271	-6,080	-146	-168	-36	-439	3,286
Barrow	1990	-51	-1,136	-65	-159	-23	-17	-847	-6,842	-163	-131	-98	-401	6,914
Barrow	2000	-58	-1,342	-61	-144	-23	-22	-513	-7,119	-168	-6	-107	-1,690	7,281
Bartow	1980	-161	-1,401	-47	-937	0	6	-92	-6,080	-146	-168	59	-439	2,270
Bartow	1990	-162	-1,431	-47	-392	-16	8	-257	-6,842	-163	-131	25	-401	7,328
Bartow	2000	-202	-1,619	-40	-144	-29	10	-292	-7,119	-168	-6	5	-1,690	9,263
Butts	1980	-746	-1,626	-35	-89	0	16	-26	-6,080	-146	-168	-96	-439	2,224
Butts	1990	-747	-1,624	-35	-132	-17	-41	-104	-6,842	-163	-131	-211	-401	4,928
Butts	2000	-299	-1,650	-25	-144	-11	-98	-40	-7,119	-168	-6	-258	-1,690	7,165
Carroll	1980	-57	-1,254	-37	-96	0	-14	-95	-6,080	-146	-168	-25	-439	3,386
Carroll	1990	-58	-1,262	-37	-126	-20	-36	-336	-6,842	-163	-131	-104	-401	6,996
Carroll	2000	-275	-1,331	-28	-144	-23	-60	-484	-7,119	-168	-6	-149	-1,690	5,915
Cherokee	1980	-556	-618	-47	-289	-21	7	-122	-6,080	-146	-168	-39	-439	3,885
Cherokee	1990	-557	-730	-47	-275	-27	-9	-319	-6,842	-163	-131	-90	-401	9,999
Cherokee	2000	-314	-852	-40	-144	-37	-18	-208	-7,119	-168	-6	-98	-1,690	14,160
Clayton	1980	-351	-886	-82	-98	-91	-5	-1	-6,080	-146	-168	-4	-439	4,999
Clayton	1990	-352	-933	-82	-134	-62	-15	-4	-6,842	-163	-131	-30	-401	10,373
Clayton	2000	-440	-1,178	-82	-144	-49	-24	-5	-7,119	-168	-6	-39	-1,690	6,937
Cobb	1980	-206	-710	-70	-284	-86	-4	-2	-6,080	-146	-168	-8	-439	6,668
Cobb	1990	-207	-725	-70	-187	-61	-9	-5	-6,842	-163	-131	-33	-401	14,438
Cobb	2000	-187	-1,014	-67	-144	-49	-13	-7	-7,119	-168	-6	-41	-1,690	15,895
Coweta	1980	-88	-1,077	-47	-74	0	-99	-22	-6,080	-146	-168	-48	-439	3,662
Coweta	1990	-89	-1,099	-47	-166	-15	-184	-74	-6,842	-163	-131	-140	-401	8,615
Coweta	2000	-96	-1,310	-40	-144	-27	-210	-32	-7,119	-168	-6	-145	-1,690	10,327
Dawson	1980	-426	-1,534	-73	-638	0	-20	-695	-6,080	-146	-168	-204	-439	1,091
Dawson	1990	-427	-1,632	-73	-284	0	-76	-1,242	-6,842	-163	-131	-320	-401	5,471
Dawson	2000	-128	-1,719	-71	-144	0	-99	-570	-7,119	-168	-6	-310	-1,690	8,614

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Table 60 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
DeKalb	1980	-141	-1,056	-74	-176	-94	-3	-0	-6,080	-146	-168	-7	-439	5,788
DeKalb	1990	-143	-1,150	-74	-184	-63	-8	-1	-6,842	-163	-131	-23	-401	12,369
DeKalb	2000	-148	-1,212	-72	-144	-49	-13	-1	-7,119	-168	-6	-29	-1,690	12,182
Douglas	1980	-156	-979	-60	-369	-66	-22	-3	-6,080	-146	-168	11	-439	4,283
Douglas	1990	-157	-1,038	-60	-175	-48	-43	-12	-6,842	-163	-131	-46	-401	9,910
Douglas	2000	-156	-1,246	-56	-144	-40	-62	-12	-7,119	-168	-6	-74	-1,690	10,570
Fayette	1980	-96	-387	-31	-692	-4	-69	-9	-6,080	-146	-168	1	-439	6,788
Fayette	1990	-97	-434	-31	-270	-30	-83	-21	-6,842	-163	-131	-48	-401	15,306
Fayette	2000	-111	-649	-21	-144	-39	-109	-49	-7,119	-168	-6	-64	-1,690	17,943
Forsyth	1980	-452	-578	-44	-221	0	-4	-324	-6,080	-146	-168	-39	-439	3,881
Forsyth	1990	-454	-616	-44	-231	-4	-18	-877	-6,842	-163	-131	-116	-401	10,392
Forsyth	2000	-297	-818	-36	-144	-32	-18	-510	-7,119	-168	-6	-89	-1,690	15,736
Fulton	1980	-102	-1,261	-76	-194	-92	-0	-2	-6,080	-146	-168	-9	-439	4,740
Fulton	1990	-104	-1,259	-76	-181	-62	-5	-8	-6,842	-163	-131	-29	-401	11,628
Fulton	2000	-106	-1,434	-75	-144	-49	-9	-4	-7,119	-168	-6	-38	-1,690	13,482
Gwinnett	1980	-170	-301	-48	-511	-61	-0	-12	-6,080	-146	-168	-31	-439	6,488
Gwinnett	1990	-171	-375	-48	-240	-56	-6	-26	-6,842	-163	-131	-65	-401	14,584
Gwinnett	2000	-192	-497	-40	-144	-48	-8	-21	-7,119	-168	-6	-63	-1,690	14,928
Haralson	1980	-832	-1,539	-21	-86	0	-37	-107	-6,080	-146	-168	-166	-439	2,335
Haralson	1990	-834	-1,629	-21	-121	-21	-84	-414	-6,842	-163	-131	-335	-401	5,798
Haralson	2000	-73	-1,608	-8	-144	-8	-137	-315	-7,119	-168	-6	-442	-1,690	5,852
Heard	1980	-135	-893	-44	-105	0	-392	-117	-6,080	-146	-168	-381	-439	2,149
Heard	1990	-136	-893	-44	-132	0	-708	-714	-6,842	-163	-131	-615	-401	4,039
Heard	2000	-76	-895	-36	-144	0	-1,019	-680	-7,119	-168	-6	-730	-1,690	3,272
Henry	1980	-350	-790	-62	-293	-9	-49	-21	-6,080	-146	-168	4	-439	4,773
Henry	1990	-352	-829	-62	-224	-15	-121	-64	-6,842	-163	-131	-108	-401	10,249
Henry	2000	-72	-1,044	-57	-144	-35	-125	-18	-7,119	-168	-6	-102	-1,690	11,845
Jasper	1980	-252	-1,466	-29	-94	0	-173	-403	-6,080	-146	-168	-239	-439	2,523
Jasper	1990	-253	-1,470	-29	-139	0	-548	-1,495	-6,842	-163	-131	-469	-401	4,073

Continued on next page

Table 60 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Jasper	2000	-381	-1,491	-18	-144	0	-839	-1,146	-7,119	-168	-6	-531	-1,690	3,474
Lamar	1980	-214	-908	-44	-81	0	-45	-66	-6,080	-146	-168	-90	-439	3,635
Lamar	1990	-216	-893	-44	-126	-24	-195	-294	-6,842	-163	-131	-241	-401	6,299
Lamar	2000	-308	-903	-36	-144	-21	-346	-387	-7,119	-168	-6	-318	-1,690	6,172
Meriwether	1980	-362	-1,307	-24	-66	0	-144	-36	-6,080	-146	-168	-204	-439	1,999
Meriwether	1990	-363	-1,311	-24	-103	-12	-455	-141	-6,842	-163	-131	-306	-401	3,983
Meriwether	2000	-376	-1,275	-12	-144	-9	-925	-129	-7,119	-168	-6	-415	-1,690	4,059
Newton	1980	-74	-1,023	-73	-111	0	-0	-42	-6,080	-146	-168	-9	-439	3,816
Newton	1990	-75	-1,111	-73	-154	-16	-35	-120	-6,842	-163	-131	-98	-401	7,531
Newton	2000	-83	-1,240	-71	-144	-27	-59	-50	-7,119	-168	-6	-122	-1,690	8,412
Paulding	1980	-106	-815	-35	-375	0	-34	-56	-6,080	-146	-168	-72	-439	3,024
Paulding	1990	-107	-866	-35	-332	-4	-68	-192	-6,842	-163	-131	-127	-401	7,986
Paulding	2000	-143	-1,026	-26	-144	-29	-69	-164	-7,119	-168	-6	-104	-1,690	9,776
Pickens	1980	-55	-1,502	-32	-124	0	3	-265	-6,080	-146	-168	-33	-439	2,917
Pickens	1990	-56	-1,609	-32	-166	0	-1	-899	-6,842	-163	-131	-187	-401	7,321
Pickens	2000	-74	-1,624	-22	-144	-11	-3	-1,093	-7,119	-168	-6	-212	-1,690	9,481
Pike	1980	-152	-707	-29	-96	0	-143	-101	-6,080	-146	-168	-88	-439	3,769
Pike	1990	-153	-695	-29	-138	0	-284	-328	-6,842	-163	-131	-235	-401	7,311
Pike	2000	-257	-705	-18	-144	0	-390	-506	-7,119	-168	-6	-290	-1,690	7,842
Rockdale	1980	-44	-737	-73	-182	-30	-22	-5	-6,080	-146	-168	-5	-439	5,702
Rockdale	1990	-46	-865	-73	-228	-26	-49	-13	-6,842	-163	-131	-42	-401	11,396
Rockdale	2000	-45	-889	-70	-144	-42	-77	-12	-7,119	-168	-6	-60	-1,690	11,657
Spalding	1980	-256	-1,533	-36	-149	0	10	-15	-6,080	-146	-168	-30	-439	3,000
Spalding	1990	-257	-1,562	-36	-308	-30	4	-71	-6,842	-163	-131	-65	-401	6,701
Spalding	2000	-89	-1,611	-27	-144	-30	-3	-76	-7,119	-168	-6	-96	-1,690	7,009
Walton	1980	-714	-821	-61	-122	0	14	-76	-6,080	-146	-168	-10	-439	2,692
Walton	1990	-715	-852	-61	-164	-25	-9	-294	-6,842	-163	-131	-52	-401	6,828
Walton	2000	-197	-922	-56	-144	-21	-26	-226	-7,119	-168	-6	-60	-1,690	8,616

Column headings refer to GPI alphabetical organization, see Section 5.2

B.2.2 Cities

Table 61: GPI Sub-measures by City, A-M

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Acworth	1980	8,685	0.37	5,468	7,054	89	1,433	7	-319	-127	0	-118	-1,648	-568
Acworth	1990	19,030	0.41	11,238	6,619	93	1,680	10	-319	-112	-633	-411	-1,527	-810
Acworth	2000	22,615	0.36	14,583	7,040	171	1,966	11	-319	-26	-1,427	-709	-1,851	-1,341
Aldora	1980	4,851	0.42	2,830	6,396	57	801	7	-150	-127	0	-1,393	-920	-151
Aldora	1990	11,415	0.27	8,342	6,618	58	1,007	10	-150	-112	-209	-219	-916	-237
Aldora	2000	11,014	0.27	8,074	5,648	98	957	11	-150	-99	-743	0	-901	-368
Alpharetta	1980	11,027	0.34	7,324	6,920	111	1,820	7	-319	-127	0	-189	-2,092	-698
Alpharetta	1990	28,521	0.37	18,035	6,627	153	2,517	10	-319	-112	-768	-313	-2,289	-1,110
Alpharetta	2000	40,615	0.44	22,701	6,925	223	3,531	11	-319	-27	-1,789	-698	-3,324	-1,794
Atlanta	1980	8,694	0.48	4,497	7,660	109	1,435	7	-319	-127	0	-577	-1,650	-605
Atlanta	1990	21,238	0.57	9,100	7,742	122	1,874	10	-319	-112	-960	-979	-1,705	-773
Atlanta	2000	26,545	0.57	11,317	7,972	169	2,308	11	-319	-63	-2,213	-2,681	-2,173	-1,140
Auburn	1980	6,150	0.42	3,537	6,708	54	1,015	7	-319	-127	0	-285	-1,167	-493
Auburn	1990	17,443	0.29	12,444	6,210	98	1,540	10	-319	-112	-748	-650	-1,400	-896
Auburn	2000	20,624	0.33	13,792	5,895	120	1,793	11	-319	-31	-1,200	-709	-1,688	-1,198
Austell	1980	7,202	0.32	4,907	6,928	74	1,189	7	-319	-127	0	-686	-1,366	-517
Austell	1990	16,199	0.40	9,788	7,195	86	1,430	10	-319	-112	-903	-786	-1,300	-640
Austell	2000	16,402	0.35	10,590	7,370	123	1,426	11	-319	-54	-951	-1,011	-1,342	-851
Avondale Estates	1980	14,998	0.37	9,383	8,209	199	2,475	7	-319	-127	0	-158	-2,846	-763
Avondale Estates	1990	33,467	0.39	20,565	6,958	172	2,954	10	-319	-112	-1,405	-356	-2,686	-1,126
Avondale Estates	2000	43,883	0.41	25,925	8,113	295	3,815	11	-319	-69	-2,150	-350	-3,592	-1,948
Ball Ground	1980	6,531	0.38	4,027	7,844	82	1,078	7	-319	-127	0	-246	-1,239	-534
Ball Ground	1990	15,112	0.42	8,780	7,506	87	1,334	10	-319	-112	-115	-338	-1,213	-639
Ball Ground	2000	18,691	0.39	11,495	6,857	116	1,625	11	-319	-83	-892	-382	-1,530	-1,025
Barnesville	1980	5,867	0.41	3,458	7,856	81	968	7	-150	-127	0	-660	-1,113	-262
Barnesville	1990	12,363	0.43	7,066	7,338	88	1,091	10	-150	-112	-618	-862	-992	-370
Barnesville	2000	15,886	0.51	7,839	8,478	125	1,381	11	-150	-58	-1,410	-1,700	-1,300	-561

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Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Berkeley Lake	1980	16,814	0.32	11,355	7,443	193	2,775	7	-319	-127	0	-438	-3,190	-905
Berkeley Lake	1990	37,367	0.30	26,289	6,986	183	3,298	10	-319	-112	-1,019	-139	-2,999	-1,409
Berkeley Lake	2000	44,742	0.34	29,706	7,365	258	3,889	11	-319	-31	-1,127	-367	-3,662	-2,045
Bethlehem	1980	8,148	0.35	5,289	7,338	71	1,345	7	-319	-127	0	-450	-1,546	-483
Bethlehem	1990	20,821	0.62	7,901	6,978	72	1,838	10	-319	-112	-119	-124	-1,671	-626
Bethlehem	2000	17,730	0.34	11,690	6,718	113	1,541	11	-319	-42	-1,188	-566	-1,451	-924
Bowdon	1980	8,499	0.41	4,992	7,397	94	1,403	7	-319	-127	0	-339	-1,612	-375
Bowdon	1990	13,343	0.42	7,748	7,533	95	1,178	10	-319	-112	-463	-402	-1,071	-456
Bowdon	2000	15,417	0.46	8,301	7,955	123	1,340	11	-319	-68	-872	-1,208	-1,262	-604
Braswell	1980	7,158	0.24	5,444	6,544	36	1,181	7	-319	-127	0	-808	-1,358	-793
Braswell	1990	14,728	0.35	9,574	28,515	313	1,300	10	-319	-112	-98	-3,264	-1,182	-784
Braswell	2000	14,703	0.22	11,397	6,696	78	1,278	11	-319	-59	-205	-1,821	-1,203	-534
Bremen	1980	7,606	0.36	4,869	7,675	98	1,255	7	-150	-127	0	-588	-1,443	-318
Bremen	1990	15,348	0.42	8,936	7,683	106	1,355	10	-150	-112	-797	-552	-1,232	-493
Bremen	2000	17,338	0.45	9,569	8,032	139	1,507	11	-150	-64	-885	-914	-1,419	-761
Brooks	1980	8,073	0.43	4,585	8,557	89	1,332	7	-319	-127	0	-157	-1,532	-496
Brooks	1990	20,879	0.34	13,818	7,139	106	1,843	10	-319	-112	-488	-577	-1,676	-1,037
Brooks	2000	29,045	0.40	17,439	8,042	159	2,525	11	-319	-40	-1,578	-263	-2,377	-1,823
Buchanan	1980	5,530	0.37	3,473	7,921	71	913	7	-150	-127	0	-488	-1,049	-247
Buchanan	1990	11,082	0.42	6,386	8,458	78	978	10	-150	-112	-406	-747	-890	-388
Buchanan	2000	12,176	0.42	7,022	8,370	113	1,058	11	-150	-71	-1,029	-753	-997	-533
Buford	1980	7,410	0.34	4,925	7,036	75	1,223	7	-319	-127	0	-537	-1,406	-425
Buford	1990	15,638	0.40	9,420	7,184	89	1,380	10	-319	-112	-622	-802	-1,255	-547
Buford	2000	18,857	0.45	10,420	7,498	126	1,639	11	-319	-56	-1,225	-906	-1,543	-843
Canton	1980	7,763	0.39	4,702	7,993	92	1,281	7	-319	-127	0	-319	-1,473	-354
Canton	1990	17,029	0.49	8,763	6,702	82	1,503	10	-319	-112	-351	-384	-1,367	-563
Canton	2000	17,844	0.39	10,806	7,350	131	1,551	11	-319	-50	-995	-617	-1,460	-762
Carl	1980	7,487	0.43	4,296	8,153	81	1,236	7	-319	-127	0	-124	-1,420	-575
Carl	1990	19,523	0.45	10,832	6,582	110	1,723	10	-319	-112	-967	-314	-1,567	-623

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Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Carl	2000	21,576	0.36	13,800	9,490	167	1,876	11	-319	-86	-580	-260	-1,766	-1,083
Carrollton	1980	7,419	0.46	4,007	8,088	89	1,224	7	-319	-127	0	-483	-1,408	-294
Carrollton	1990	16,189	0.50	8,173	8,042	89	1,429	10	-319	-112	-721	-736	-1,299	-408
Carrollton	2000	17,307	0.53	8,200	8,415	128	1,505	11	-319	-56	-941	-1,122	-1,417	-567
Cartersville	1980	8,747	0.43	5,006	7,661	89	1,444	7	-319	-127	0	-391	-1,660	-375
Cartersville	1990	19,580	0.48	10,098	7,279	98	1,728	10	-319	-112	-527	-607	-1,572	-571
Cartersville	2000	20,576	0.47	10,980	7,641	152	1,789	11	-319	-54	-1,049	-947	-1,684	-764
Centralhatchee	1980	7,870	0.36	5,012	8,011	85	1,299	7	-150	-127	0	-201	-1,493	-493
Centralhatchee	1990	12,702	0.32	8,656	6,504	66	1,121	10	-150	-112	-190	-259	-1,020	-472
Centralhatchee	2000	15,956	0.35	10,343	6,713	130	1,387	11	-150	-69	-824	-209	-1,306	-917
Chamblee	1980	10,075	0.34	6,700	6,860	116	1,663	7	-319	-127	0	-318	-1,912	-464
Chamblee	1990	15,746	0.40	9,485	6,695	110	1,390	10	-319	-112	-504	-1,263	-1,264	-508
Chamblee	2000	15,957	0.41	9,431	7,217	124	1,387	11	-319	-54	-518	-1,458	-1,306	-743
Clarkston	1980	10,715	0.32	7,237	7,013	119	1,768	7	-319	-127	0	-278	-2,033	-648
Clarkston	1990	19,404	0.34	12,880	6,938	127	1,713	10	-319	-112	-84	-674	-1,557	-798
Clarkston	2000	14,733	0.35	9,638	6,363	137	1,281	11	-319	-50	-405	-1,054	-1,206	-734
College Park	1980	9,525	0.37	6,021	7,120	107	1,572	7	-319	-127	0	-664	-1,807	-599
College Park	1990	14,414	0.40	8,694	6,985	107	1,272	10	-319	-112	-366	-1,040	-1,157	-548
College Park	2000	14,802	0.41	8,738	7,189	130	1,287	11	-319	-66	-982	-1,405	-1,212	-728
Concord	1980	7,968	0.49	4,096	6,874	89	1,315	7	-150	-127	0	-154	-1,512	-529
Concord	1990	15,757	0.48	8,193	7,875	117	1,391	10	-150	-112	-264	-1,025	-1,265	-555
Concord	2000	16,385	0.41	9,655	8,603	165	1,424	11	-150	-45	-724	-238	-1,341	-625
Conyers	1980	8,837	0.37	5,587	7,178	92	1,458	7	-319	-127	0	-270	-1,677	-541
Conyers	1990	15,882	0.38	9,879	6,328	88	1,402	10	-319	-112	-369	-523	-1,275	-515
Conyers	2000	16,279	0.40	9,788	7,938	140	1,415	11	-319	-53	-729	-1,086	-1,332	-690
Covington	1980	6,960	0.40	4,206	7,328	77	1,149	7	-319	-127	0	-561	-1,321	-347
Covington	1990	14,423	0.48	7,536	8,103	85	1,273	10	-319	-112	-669	-1,059	-1,158	-415
Covington	2000	16,021	0.45	8,758	7,696	117	1,393	11	-319	-57	-1,218	-1,060	-1,311	-609
Cumming	1980	7,319	0.43	4,140	7,338	84	1,208	7	-319	-127	0	-365	-1,389	-424

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Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Cumming	1990	18,537	0.45	10,280	7,800	87	1,636	10	-319	-112	-1,325	-609	-1,488	-663
Cumming	2000	16,938	0.44	9,535	8,581	143	1,472	11	-319	-48	-1,213	-447	-1,386	-690
Dacula	1980	7,344	0.32	4,979	6,458	73	1,212	7	-319	-127	0	-233	-1,393	-522
Dacula	1990	18,411	0.32	12,585	6,729	102	1,625	10	-319	-112	-249	-389	-1,478	-739
Dacula	2000	20,312	0.29	14,491	6,924	143	1,766	11	-319	-39	-733	-838	-1,662	-1,199
Dallas	1980	7,276	0.38	4,493	7,707	79	1,201	7	-319	-127	0	-420	-1,381	-455
Dallas	1990	12,952	0.45	7,124	6,983	66	1,143	10	-319	-112	-340	-737	-1,040	-519
Dallas	2000	16,285	0.39	9,910	7,359	114	1,416	11	-319	-41	-1,425	-753	-1,333	-911
Dawsonville	1980	7,126	0.45	3,905	7,360	82	1,176	7	-150	-127	0	-325	-1,352	-392
Dawsonville	1990	11,697	0.38	7,261	7,199	76	1,032	10	-150	-112	-574	-375	-939	-416
Dawsonville	2000	20,813	0.55	9,319	7,526	127	1,809	11	-150	-51	-1,553	-396	-1,704	-983
Decatur	1980	9,510	0.41	5,596	8,159	136	1,569	7	-319	-127	0	-325	-1,804	-618
Decatur	1990	22,344	0.47	11,889	8,154	160	1,972	10	-319	-112	-867	-702	-1,793	-773
Decatur	2000	30,244	0.47	16,068	8,237	234	2,629	11	-319	-64	-1,413	-1,079	-2,475	-1,235
Doraville	1980	9,797	0.35	6,405	6,555	121	1,617	7	-319	-127	0	-243	-1,859	-515
Doraville	1990	20,272	0.33	13,487	7,339	133	1,789	10	-319	-112	-557	-621	-1,627	-624
Doraville	2000	15,499	0.38	9,650	7,417	124	1,347	11	-319	-52	-796	-1,106	-1,269	-707
Douglasville	1980	7,998	0.40	4,782	7,221	90	1,320	7	-319	-127	0	-380	-1,518	-480
Douglasville	1990	19,347	0.43	11,056	6,525	97	1,708	10	-319	-112	-994	-626	-1,553	-730
Douglasville	2000	22,951	0.45	12,642	7,163	153	1,995	11	-319	-42	-1,859	-1,010	-1,879	-1,183
Duluth	1980	9,832	0.32	6,701	6,524	100	1,623	7	-319	-127	0	-119	-1,865	-555
Duluth	1990	27,614	0.35	17,877	6,113	135	2,437	10	-319	-112	-741	-405	-2,216	-988
Duluth	2000	30,061	0.37	19,020	7,258	216	2,613	11	-319	-30	-1,142	-435	-2,460	-1,452
East Point	1980	9,507	0.39	5,780	7,517	112	1,569	7	-319	-127	0	-567	-1,804	-603
East Point	1990	17,386	0.42	10,072	7,418	114	1,535	10	-319	-112	-577	-977	-1,395	-674
East Point	2000	15,630	0.43	8,964	7,205	132	1,359	11	-319	-58	-951	-1,520	-1,279	-783
Emerson	1980	6,600	0.35	4,319	6,438	59	1,089	7	-319	-127	0	-329	-1,252	-281
Emerson	1990	12,554	0.34	8,278	8,151	85	1,108	10	-319	-112	-208	-633	-1,008	-429
Emerson	2000	16,758	0.43	9,511	8,003	112	1,457	11	-319	-66	-1,206	-1,269	-1,372	-792

Continued on next page

Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Ephesus	1980	6,246	0.37	3,908	7,450	80	1,031	7	-150	-127	0	-355	-1,185	-418
Ephesus	1990	10,910	0.44	6,121	8,223	78	963	10	-150	-112	-978	-803	-876	-405
Ephesus	2000	20,341	0.49	10,385	7,469	128	1,768	11	-150	-56	-1,923	-494	-1,665	-975
Euharlee	1980	7,196	0.30	5,066	5,604	58	1,188	7	-319	-127	0	-136	-1,365	-413
Euharlee	1990	15,654	0.34	10,304	6,831	78	1,382	10	-319	-112	-240	-975	-1,256	-667
Euharlee	2000	18,007	0.29	12,794	6,545	122	1,565	11	-319	-18	-874	-1,017	-1,474	-1,097
Fairburn	1980	9,089	0.39	5,511	7,143	93	1,500	7	-319	-127	0	-470	-1,724	-529
Fairburn	1990	17,881	0.38	11,161	6,427	92	1,578	10	-319	-112	-935	-481	-1,435	-647
Fairburn	2000	19,465	0.41	11,576	7,036	136	1,692	11	-319	-56	-2,064	-808	-1,593	-920
Fayetteville	1980	9,840	0.37	6,168	7,235	109	1,624	7	-319	-127	0	-259	-1,867	-653
Fayetteville	1990	22,475	0.35	14,681	7,723	128	1,984	10	-319	-112	-1,170	-416	-1,804	-863
Fayetteville	2000	27,348	0.38	17,009	7,802	194	2,377	11	-319	-34	-2,089	-649	-2,238	-1,323
Flovilla	1980	4,700	0.40	2,824	7,347	61	776	7	-150	-127	0	-487	-892	-275
Flovilla	1990	11,600	0.40	6,911	6,622	65	1,024	10	-150	-112	-938	-551	-931	-522
Flovilla	2000	16,183	0.41	9,482	7,442	97	1,407	11	-150	-62	-2,060	-1,210	-1,325	-768
Forest Park	1980	9,243	0.34	6,127	7,107	85	1,525	7	-319	-127	0	-459	-1,754	-541
Forest Park	1990	16,605	0.38	10,235	7,169	93	1,466	10	-319	-112	-423	-721	-1,333	-549
Forest Park	2000	15,380	0.42	8,986	7,206	106	1,337	11	-319	-54	-1,203	-1,238	-1,259	-688
Franklin	1980	6,209	0.42	3,572	8,736	75	1,025	7	-150	-127	0	-289	-1,178	-303
Franklin	1990	11,074	0.48	5,795	8,834	85	977	10	-150	-112	-733	-676	-889	-354
Franklin	2000	14,566	0.58	6,140	8,571	112	1,266	11	-150	-65	-900	-624	-1,192	-540
Gay	1980	7,449	0.36	4,778	8,882	125	1,229	7	-150	-127	0	0	-1,413	-525
Gay	1990	18,458	0.54	8,457	9,512	105	1,629	10	-150	-112	-2	-1,098	-1,482	-761
Gay	2000	21,465	0.50	10,755	6,016	115	1,866	11	-150	-60	-1,353	-358	-1,757	-1,137
Good Hope	1980	8,035	0.35	5,216	7,451	89	1,326	7	-319	-127	0	0	-1,525	-397
Good Hope	1990	16,540	0.32	11,250	6,573	100	1,460	10	-319	-112	-56	-246	-1,328	-557
Good Hope	2000	21,586	0.35	14,000	8,126	162	1,876	11	-319	-62	-987	-694	-1,767	-1,146
Grantville	1980	6,178	0.42	3,613	7,815	68	1,020	7	-319	-127	0	-429	-1,172	-364
Grantville	1990	12,375	0.40	7,416	7,707	81	1,092	10	-319	-112	-658	-906	-993	-490

Continued on next page

Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Grantville	2000	14,401	0.44	8,044	7,615	100	1,252	11	-319	-61	-1,018	-795	-1,179	-715
Grayson	1980	8,822	0.36	5,647	6,724	85	1,456	7	-319	-127	0	-702	-1,674	-481
Grayson	1990	19,422	0.34	12,883	6,131	106	1,714	10	-319	-112	-883	-117	-1,559	-808
Grayson	2000	23,376	0.41	13,904	7,559	169	2,032	11	-319	-48	-1,815	-720	-1,913	-1,213
Greenville	1980	5,875	0.45	3,226	7,428	79	970	7	-150	-127	0	-355	-1,115	-362
Greenville	1990	12,025	0.52	5,733	7,458	81	1,061	10	-150	-112	-434	-757	-965	-431
Greenville	2000	13,387	0.47	7,065	7,505	116	1,164	11	-150	-83	-796	-1,217	-1,096	-564
Griffin	1980	7,669	0.42	4,414	7,443	87	1,266	7	-319	-127	0	-515	-1,455	-334
Griffin	1990	14,623	0.47	7,757	7,535	94	1,291	10	-319	-112	-411	-911	-1,174	-439
Griffin	2000	16,030	0.48	8,397	7,747	125	1,393	11	-319	-62	-1,074	-1,251	-1,312	-614
Hampton	1980	8,302	0.39	5,030	7,238	85	1,370	7	-319	-127	0	-388	-1,575	-574
Hampton	1990	15,008	0.36	9,579	6,940	92	1,325	10	-319	-112	-933	-729	-1,205	-677
Hampton	2000	19,492	0.37	12,298	7,411	127	1,694	11	-319	-46	-1,493	-698	-1,595	-891
Hapeville	1980	9,652	0.37	6,103	8,036	104	1,593	7	-319	-127	0	-536	-1,831	-520
Hapeville	1990	17,069	0.37	10,753	8,062	108	1,507	10	-319	-112	-645	-959	-1,370	-589
Hapeville	2000	16,267	0.38	10,076	7,773	134	1,414	11	-319	-60	-1,013	-1,049	-1,331	-697
Haralson	1980	8,985	0.33	5,994	6,800	78	1,483	7	-319	-127	0	-503	-1,705	-620
Haralson	1990	11,968	0.34	7,892	7,155	73	1,056	10	-319	-112	-155	-393	-961	-494
Haralson	2000	16,836	0.32	11,504	6,665	104	1,464	11	-319	-65	-465	-1,382	-1,378	-683
Hiram	1980	7,654	0.37	4,797	6,128	71	1,263	7	-319	-127	0	-708	-1,452	-773
Hiram	1990	15,383	0.36	9,818	6,536	75	1,358	10	-319	-112	-840	-594	-1,235	-718
Hiram	2000	19,832	0.36	12,692	7,456	119	1,724	11	-319	-73	-1,911	-957	-1,623	-1,034
Holly Springs	1980	8,952	0.35	5,860	7,376	88	1,477	7	-319	-127	0	-138	-1,698	-745
Holly Springs	1990	19,446	0.27	14,161	5,688	99	1,716	10	-319	-112	-460	-339	-1,561	-928
Holly Springs	2000	23,682	0.30	16,533	6,508	141	2,059	11	-319	-56	-759	-168	-1,938	-1,514
Jackson	1980	7,393	0.44	4,123	7,261	80	1,220	7	-150	-127	0	-367	-1,403	-484
Jackson	1990	14,644	0.45	8,077	7,253	83	1,292	10	-150	-112	-694	-931	-1,175	-511
Jackson	2000	16,173	0.50	8,150	8,167	132	1,406	11	-150	-76	-1,055	-905	-1,324	-590
Jasper	1980	7,201	0.40	4,314	7,941	97	1,188	7	-319	-127	0	-319	-1,366	-298

Continued on next page

Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Jasper	1990	16,338	0.46	8,780	7,179	92	1,442	10	-319	-112	-324	-545	-1,311	-522
Jasper	2000	19,760	0.48	10,243	7,999	139	1,718	11	-319	-61	-1,025	-186	-1,617	-748
Jenkinsburg	1980	4,617	0.43	2,637	10,812	90	762	7	-150	-127	0	-96	-876	-316
Jenkinsburg	1990	14,580	0.32	9,957	6,930	84	1,287	10	-150	-112	-532	-556	-1,170	-568
Jenkinsburg	2000	17,960	0.35	11,595	6,798	107	1,561	11	-150	-70	-1,271	-455	-1,470	-895
Jonesboro	1980	8,430	0.36	5,373	7,372	84	1,391	7	-319	-127	0	-472	-1,599	-489
Jonesboro	1990	16,174	0.45	8,934	6,546	78	1,428	10	-319	-112	-277	-949	-1,298	-514
Jonesboro	2000	16,663	0.44	9,352	7,250	134	1,449	11	-319	-73	-487	-706	-1,364	-656
Kennesaw	1980	9,072	0.31	6,274	6,298	94	1,497	7	-319	-127	0	-154	-1,721	-574
Kennesaw	1990	20,749	0.30	14,488	6,598	124	1,831	10	-319	-112	-731	-523	-1,665	-853
Kennesaw	2000	25,500	0.32	17,427	7,057	191	2,217	11	-319	-28	-1,418	-513	-2,087	-1,471
Kingston	1980	5,971	0.38	3,716	7,232	63	985	7	-319	-127	0	-610	-1,133	-452
Kingston	1990	11,340	0.36	7,278	8,234	79	1,001	10	-319	-112	-289	-498	-910	-421
Kingston	2000	18,869	0.50	9,391	8,114	105	1,640	11	-319	-62	-826	-262	-1,544	-914
Lake City	1980	10,568	0.36	6,755	7,268	95	1,744	7	-319	-127	0	-323	-2,005	-593
Lake City	1990	20,968	0.31	14,497	7,050	104	1,851	10	-319	-112	-206	-395	-1,683	-612
Lake City	2000	16,353	0.32	11,102	7,940	136	1,422	11	-319	-66	-1,171	-512	-1,338	-715
Lawrenceville	1980	9,374	0.42	5,484	6,929	95	1,547	7	-319	-127	0	-376	-1,779	-551
Lawrenceville	1990	20,126	0.38	12,564	6,565	112	1,776	10	-319	-112	-542	-500	-1,615	-777
Lawrenceville	2000	20,238	0.41	11,841	7,482	148	1,759	11	-319	-52	-1,194	-775	-1,656	-957
Lilburn	1980	10,675	0.29	7,550	6,429	113	1,762	7	-319	-127	0	-288	-2,025	-791
Lilburn	1990	25,544	0.39	15,531	6,974	140	2,255	10	-319	-112	-1,059	-435	-2,050	-927
Lilburn	2000	23,178	0.38	14,374	7,395	177	2,015	11	-319	-55	-1,262	-640	-1,897	-1,133
Lithonia	1980	5,673	0.45	3,140	7,590	68	936	7	-319	-127	0	-939	-1,076	-280
Lithonia	1990	10,905	0.44	6,132	6,553	73	962	10	-319	-112	-781	-544	-875	-371
Lithonia	2000	10,923	0.44	6,085	7,522	107	950	11	-319	-76	-1,140	-1,239	-894	-611
Locust Grove	1980	6,471	0.34	4,257	7,829	78	1,068	7	-319	-127	0	-410	-1,228	-525
Locust Grove	1990	20,127	0.39	12,186	6,732	79	1,776	10	-319	-112	-1,286	-737	-1,615	-921
Locust Grove	2000	16,604	0.34	10,960	7,300	122	1,443	11	-319	-48	-1,317	-1,135	-1,359	-884

Continued on next page

Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Loganville	1980	7,470	0.36	4,793	7,018	73	1,233	7	-319	-127	0	-309	-1,417	-518
Loganville	1990	18,258	0.40	10,965	6,104	83	1,611	10	-319	-112	-395	-473	-1,465	-874
Loganville	2000	21,267	0.38	13,093	7,189	146	1,849	11	-319	-40	-841	-360	-1,741	-1,196
Lone Oak	1980	6,363	0.36	4,053	7,464	88	1,050	7	-150	-127	0	0	-1,207	-569
Lone Oak	1990	16,106	0.47	8,516	7,944	104	1,422	10	-150	-112	760	-394	-1,293	-555
Lone Oak	2000	16,070	0.31	11,089	8,918	156	1,397	11	-150	-104	-426	-2,051	-1,315	-762
Lovejoy	1980	8,708	0.38	5,377	7,252	87	1,437	7	-319	-127	0	-226	-1,652	-617
Lovejoy	1990	13,949	0.39	8,474	8,789	107	1,231	10	-319	-112	-16,074	-187	-1,120	-670
Lovejoy	2000	15,081	0.35	9,852	7,510	114	1,311	11	-319	-20	-4,634	-896	-1,234	-793
Luthersville	1980	5,677	0.37	3,564	6,938	58	937	7	-150	-127	0	-300	-1,077	-402
Luthersville	1990	11,925	0.43	6,755	7,105	69	1,053	10	-150	-112	-419	-1,245	-957	-529
Luthersville	2000	11,364	0.41	6,716	6,488	94	988	11	-150	-63	-494	-1,039	-930	-606
Manchester	1980	7,909	0.40	4,729	7,374	89	1,305	7	-150	-127	0	-277	-1,501	-328
Manchester	1990	12,283	0.40	7,312	8,057	100	1,084	10	-150	-112	-462	-783	-986	-331
Manchester	2000	14,769	0.48	7,684	8,267	135	1,284	11	-150	-68	-1,376	-1,915	-1,209	-566
Mansfield	1980	6,634	0.40	3,952	7,972	82	1,095	7	-319	-127	0	-618	-1,259	-541
Mansfield	1990	14,164	0.38	8,801	8,141	98	1,250	10	-319	-112	-363	0	-1,137	-642
Mansfield	2000	15,864	0.43	9,121	8,583	135	1,379	11	-319	-62	-1,371	-712	-1,298	-772
Marietta	1980	10,777	0.41	6,401	7,443	119	1,779	7	-319	-127	0	-384	-2,045	-564
Marietta	1990	21,973	0.43	12,458	7,456	134	1,939	10	-319	-112	-626	-643	-1,764	-743
Marietta	2000	24,111	0.46	13,088	7,501	172	2,096	11	-319	-52	-1,098	-1,257	-1,973	-1,101
McDonough	1980	8,356	0.41	4,947	7,372	99	1,379	7	-319	-127	0	-102	-1,585	-476
McDonough	1990	16,252	0.44	9,055	8,940	109	1,434	10	-319	-112	-702	-388	-1,304	-535
McDonough	2000	19,600	0.38	12,168	7,177	143	1,704	11	-319	-23	-1,267	-651	-1,604	-945
Meansville	1980	7,169	0.42	4,168	7,360	75	1,183	7	-150	-127	0	-266	-1,360	-502
Meansville	1990	13,248	0.37	8,286	7,971	96	1,169	10	-150	-112	-949	-804	-1,063	-572
Meansville	2000	17,415	0.36	11,077	9,024	183	1,514	11	-150	-87	-1,494	-999	-1,425	-834
Milner	1980	6,839	0.46	3,712	8,126	114	1,129	7	-150	-127	0	-419	-1,298	-518
Milner	1990	16,495	0.48	8,620	6,027	88	1,456	10	-150	-112	-127	-248	-1,324	-532

Continued on next page

Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Milner	2000	18,354	0.41	10,763	6,728	121	1,595	11	-150	-51	-1,034	-1,038	-1,502	-921
Molena	1980	4,571	0.46	2,464	7,960	75	754	7	-150	-127	0	-248	-867	-265
Molena	1990	10,378	0.39	6,345	8,064	76	916	10	-150	-112	-585	-386	-833	-450
Molena	2000	12,740	0.34	8,393	8,164	129	1,108	11	-150	-62	-938	-378	-1,043	-645
Monroe	1980	7,149	0.43	4,079	7,057	73	1,180	7	-319	-127	0	-429	-1,356	-336
Monroe	1990	12,466	0.47	6,623	7,503	82	1,100	10	-319	-112	-486	-714	-1,001	-404
Monroe	2000	15,268	0.47	8,040	7,768	110	1,327	11	-319	-58	-1,022	-1,153	-1,250	-643
Monticello	1980	6,760	0.43	3,864	7,708	88	1,116	7	-150	-127	0	-276	-1,283	-281
Monticello	1990	14,331	0.49	7,290	7,187	93	1,265	10	-150	-112	-363	-787	-1,150	-502
Monticello	2000	16,215	0.47	8,602	7,878	139	1,410	11	-150	-68	-971	-957	-1,327	-615
Moreland	1980	8,467	0.39	5,192	7,781	99	1,397	7	-319	-127	0	0	-1,606	-562
Moreland	1990	15,266	0.41	8,944	9,481	107	1,347	10	-319	-112	-350	-894	-1,225	-579
Moreland	2000	18,381	0.38	11,313	7,383	130	1,598	11	-319	-53	-436	-1,026	-1,504	-733
Morrow	1980	11,635	0.28	8,322	6,979	118	1,920	7	-319	-127	0	-299	-2,208	-657
Morrow	1990	21,845	0.34	14,314	8,976	150	1,928	10	-319	-112	-559	-580	-1,753	-722
Morrow	2000	18,070	0.38	11,197	7,505	133	1,571	11	-319	-59	-1,079	-1,350	-1,479	-754
Mount Zion	1980	6,613	0.30	4,616	6,572	77	1,091	7	-319	-127	0	-398	-1,255	-392
Mount Zion	1990	14,178	0.41	8,359	5,098	61	1,251	10	-319	-112	-523	-85	-1,138	-461
Mount Zion	2000	16,562	0.37	10,365	7,030	122	1,440	11	-319	-39	-1,128	-722	-1,356	-799
Mountain Park	1980	11,346	0.33	7,646	7,286	126	1,872	7	-319	-127	0	-193	-2,153	-832
Mountain Park	1990	26,587	0.35	17,395	7,902	197	2,347	10	-319	-112	-580	-503	-2,134	-1,362
Mountain Park	2000	32,018	0.39	19,433	7,664	203	2,783	11	-319	-71	-2,377	-1,429	-2,621	-2,005
Nelson	1980	5,904	0.38	3,641	7,949	65	974	7	-319	-127	0	-886	-1,120	-562
Nelson	1990	11,919	0.37	7,498	8,337	78	1,052	10	-319	-112	-291	-372	-957	-464
Nelson	2000	21,222	0.35	13,883	8,125	167	1,845	11	-319	-50	-1,139	-729	-1,737	-1,045
Newborn	1980	6,681	0.36	4,269	6,450	66	1,103	7	-319	-127	0	-457	-1,268	-651
Newborn	1990	13,536	0.35	8,861	5,884	80	1,195	10	-319	-112	-869	-791	-1,086	-668
Newborn	2000	14,636	0.35	9,471	7,908	140	1,272	11	-319	-52	-762	-882	-1,198	-646
Newnan	1980	8,159	0.46	4,429	7,431	89	1,347	7	-319	-127	0	-462	-1,548	-386

Continued on next page

Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Newnan	1990	16,554	0.51	8,071	7,618	98	1,461	10	-319	-112	-763	-588	-1,329	-449
Newnan	2000	19,653	0.49	9,998	7,515	140	1,708	11	-319	-52	-1,341	-1,083	-1,609	-797
Norcross	1980	9,641	0.33	6,473	7,090	111	1,591	7	-319	-127	0	-144	-1,829	-445
Norcross	1990	20,030	0.31	13,842	7,283	139	1,768	10	-319	-112	-540	-257	-1,608	-651
Norcross	2000	19,130	0.41	11,369	7,388	146	1,663	11	-319	-44	-1,018	-1,338	-1,566	-793
Orchard Hill	1980	8,615	0.44	4,819	6,109	86	1,422	7	-319	-127	0	-169	-1,635	-632
Orchard Hill	1990	15,606	0.38	9,651	6,537	72	1,377	10	-319	-112	-1,079	-673	-1,253	-508
Orchard Hill	2000	14,641	0.37	9,238	6,962	80	1,273	11	-319	-71	-463	-402	-1,198	-662
Oxford	1980	7,248	0.35	4,709	7,525	81	1,196	7	-319	-127	0	-429	-1,375	-337
Oxford	1990	12,716	0.38	7,935	7,782	70	1,122	10	-319	-112	-379	-236	-1,021	-339
Oxford	2000	14,632	0.41	8,682	8,856	108	1,272	11	-319	-72	-1,427	-5,119	-1,198	-519
Palmetto	1980	9,149	0.41	5,394	7,341	76	1,510	7	-319	-127	0	-470	-1,736	-623
Palmetto	1990	14,377	0.36	9,138	7,292	79	1,269	10	-319	-112	-173	-322	-1,154	-531
Palmetto	2000	15,550	0.42	9,037	6,901	104	1,352	11	-319	-52	-1,207	-578	-1,273	-732
Peachtree City	1980	12,484	0.29	8,823	6,094	139	2,060	7	-319	-127	0	-266	-2,369	-781
Peachtree City	1990	26,475	0.32	18,069	6,745	152	2,337	10	-319	-112	-744	-431	-2,125	-1,018
Peachtree City	2000	32,617	0.37	20,423	7,063	207	2,835	11	-319	-40	-1,218	-450	-2,670	-1,549
Pine Lake	1980	7,350	0.31	5,039	7,153	84	1,213	7	-319	-127	0	-496	-1,394	-505
Pine Lake	1990	16,155	0.32	11,011	6,205	93	1,426	10	-319	-112	-462	-925	-1,297	-726
Pine Lake	2000	22,175	0.34	14,712	7,208	201	1,928	11	-319	-87	-1,011	-406	-1,815	-1,031
Porterdale	1980	6,402	0.36	4,127	8,143	62	1,056	7	-319	-127	0	-451	-1,215	-287
Porterdale	1990	11,134	0.39	6,752	7,946	69	983	10	-319	-112	-123	-783	-894	-349
Porterdale	2000	11,136	0.39	6,830	7,641	81	968	11	-319	-67	-824	-653	-911	-510
Powder Springs	1980	8,401	0.29	5,942	6,674	80	1,387	7	-319	-127	0	-312	-1,594	-740
Powder Springs	1990	20,705	0.29	14,603	6,450	113	1,827	10	-319	-112	-631	-501	-1,662	-996
Powder Springs	2000	20,369	0.31	14,136	6,974	166	1,771	11	-319	-37	-941	-727	-1,667	-1,228
Riverdale	1980	10,745	0.31	7,446	6,608	99	1,773	7	-319	-127	0	-523	-2,039	-647
Riverdale	1990	19,864	0.34	13,083	6,557	106	1,753	10	-319	-112	-661	-663	-1,594	-727
Riverdale	2000	15,838	0.36	10,170	6,959	134	1,377	11	-319	-53	-1,135	-1,281	-1,296	-716

Continued on next page

Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Roopville	1980	6,567	0.37	4,125	7,135	103	1,084	7	-319	-127	0	-377	-1,246	-531
Roopville	1990	11,896	0.43	6,824	7,218	87	1,050	10	-319	-112	-356	0	-955	-396
Roopville	2000	17,017	0.37	10,707	10,340	181	1,479	11	-319	-100	-1,100	0	-1,393	-741
Roswell	1980	13,905	0.36	8,843	6,768	153	2,295	7	-319	-127	0	-201	-2,638	-950
Roswell	1990	33,471	0.39	20,363	6,892	168	2,954	10	-319	-112	-679	-342	-2,687	-1,389
Roswell	2000	37,092	0.42	21,603	7,409	224	3,224	11	-319	-41	-1,514	-733	-3,036	-1,776
Sandy Springs	1980	18,777	0.43	10,792	7,459	189	3,099	7	-319	-127	0	-256	-3,563	-1,095
Sandy Springs	1990	46,755	0.50	23,586	7,779	199	4,127	10	-319	0	-1,633	-454	-3,753	-1,584
Sandy Springs	2000	46,859	0.50	23,487	7,953	251	4,073	11	-319	0	-2,132	-663	-3,835	-1,849
Senoia	1980	6,569	0.38	4,093	7,290	73	1,084	7	-319	-127	0	-428	-1,246	-434
Senoia	1990	15,931	0.44	8,978	7,274	82	1,406	10	-319	-112	-868	-820	-1,279	-654
Senoia	2000	19,384	0.32	13,163	7,037	151	1,685	11	-319	-37	-1,506	-534	-1,587	-1,008
Shady Dale	1980	5,921	0.35	3,823	8,276	78	977	7	-150	-127	0	-287	-1,123	-195
Shady Dale	1990	14,139	0.36	8,998	7,893	100	1,248	10	-150	-112	-452	-170	-1,135	-508
Shady Dale	2000	11,115	0.31	7,629	6,626	102	966	11	-150	-45	-537	-220	-910	-585
Sharpsburg	1980	7,660	0.37	4,850	6,852	89	1,264	7	-319	-127	0	-235	-1,453	-745
Sharpsburg	1990	15,105	0.37	9,561	8,824	101	1,333	10	-319	-112	-495	-922	-1,212	-563
Sharpsburg	2000	23,864	0.32	16,109	6,727	147	2,075	11	-319	-43	-812	0	-1,953	-1,163
Smyrna	1980	10,871	0.32	7,381	7,088	117	1,794	7	-319	-127	0	-276	-2,063	-657
Smyrna	1990	26,630	0.36	16,941	7,059	149	2,350	10	-319	-112	-1,035	-538	-2,137	-926
Smyrna	2000	28,466	0.41	16,833	7,773	204	2,475	11	-319	-55	-1,699	-1,201	-2,330	-1,284
Snellville	1980	11,329	0.26	8,361	6,400	124	1,870	7	-319	-127	0	-233	-2,149	-948
Snellville	1990	24,357	0.33	16,306	6,874	129	2,150	10	-319	-112	-490	-353	-1,955	-1,114
Snellville	2000	26,772	0.34	17,608	7,153	178	2,327	11	-319	-54	-758	-675	-2,191	-1,444
Social Circle	1980	7,016	0.39	4,257	7,035	68	1,158	7	-319	-127	0	-228	-1,331	-335
Social Circle	1990	15,632	0.43	8,925	7,814	92	1,380	10	-319	-112	-479	-445	-1,255	-558
Social Circle	2000	19,195	0.48	9,954	7,622	124	1,669	11	-319	-55	-1,184	-1,196	-1,571	-763
Statham	1980	7,444	0.41	4,426	7,265	76	1,228	7	-319	-127	0	-422	-1,412	-462
Statham	1990	13,277	0.40	7,907	7,284	72	1,172	10	-319	-112	-657	-512	-1,066	-472

Continued on next page

Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Statham	2000	16,256	0.37	10,322	7,579	119	1,413	11	-319	-46	-907	-829	-1,331	-736
Stockbridge	1980	10,798	0.45	5,970	7,134	88	1,782	7	-319	-127	0	-511	-2,049	-592
Stockbridge	1990	18,138	0.34	12,023	6,318	91	1,601	10	-319	-112	-545	-388	-1,456	-668
Stockbridge	2000	22,021	0.36	14,089	7,110	156	1,914	11	-319	-27	-1,380	-719	-1,802	-1,077
Stone Mountain	1980	10,889	0.35	7,042	6,761	124	1,797	7	-319	-127	0	-469	-2,066	-690
Stone Mountain	1990	21,863	0.40	13,151	7,929	149	1,930	10	-319	-112	-831	-613	-1,755	-895
Stone Mountain	2000	16,614	0.34	11,018	6,683	142	1,444	11	-319	-53	-669	-1,074	-1,360	-917
Sugar Hill	1980	8,155	0.32	5,527	6,662	87	1,346	7	-319	-127	0	-193	-1,547	-593
Sugar Hill	1990	19,632	0.34	12,920	6,629	105	1,733	10	-319	-112	-1,141	-465	-1,576	-791
Sugar Hill	2000	23,894	0.33	16,000	6,625	167	2,077	11	-319	-28	-1,467	-469	-1,956	-1,287
Sunny Side	1980	9,322	0.31	6,464	34,981	498	1,538	7	-319	-594	0	-1,360	-1,769	-1,733
Sunny Side	1990	15,535	0.43	8,878	62,642	1,048	1,371	10	-319	-112	-286	-6,677	-1,247	-345
Sunny Side	2000	12,122	0.37	7,695	75,054	1,572	1,054	11	-319	-99	-291	-8,395	-992	-506
Suwanee	1980	8,728	0.32	5,899	6,809	86	1,440	7	-319	-127	0	-327	-1,656	-545
Suwanee	1990	24,048	0.31	16,617	6,348	135	2,123	10	-319	-112	-892	-585	-1,930	-935
Suwanee	2000	30,603	0.31	21,150	7,058	209	2,660	11	-319	-19	-1,260	-218	-2,505	-1,531
Talking Rock	1980	5,460	0.43	3,121	8,287	43	901	7	-319	-127	0	-404	-1,036	-441
Talking Rock	1990	12,283	0.43	6,993	6,932	84	1,084	10	-319	-112	46	0	-986	-568
Talking Rock	2000	16,253	0.25	12,220	8,706	122	1,413	11	-319	-85	521	0	-1,330	-610
Tallapoosa	1980	7,630	0.45	4,232	7,677	80	1,259	7	-150	-127	0	-579	-1,448	-269
Tallapoosa	1990	14,491	0.45	7,924	8,457	101	1,279	10	-150	-112	-415	-418	-1,163	-372
Tallapoosa	2000	15,761	0.46	8,502	8,100	134	1,370	11	-150	-65	-771	-266	-1,290	-657
Temple	1980	7,091	0.39	4,334	7,287	77	1,170	7	-319	-127	0	-273	-1,345	-461
Temple	1990	14,121	0.44	7,936	7,320	85	1,246	10	-319	-112	-453	-736	-1,133	-591
Temple	2000	15,760	0.34	10,475	7,362	116	1,370	11	-319	-52	-888	-713	-1,290	-877
Turin	1980	6,295	0.35	4,117	7,165	65	1,039	7	-319	-127	0	-607	-1,194	-344
Turin	1990	17,116	0.36	11,020	8,468	102	1,511	10	-319	-112	-447	0	-1,374	-690
Turin	2000	20,594	0.35	13,467	9,045	159	1,790	11	-319	-73	-1,146	-840	-1,686	-941
Tyrone	1980	10,413	0.35	6,766	6,658	96	1,718	7	-319	-127	0	-385	-1,976	-695

Continued on next page

Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Tyrone	1990	23,919	0.32	16,314	6,380	111	2,111	10	-319	-112	-1,019	-402	-1,920	-959
Tyrone	2000	27,257	0.35	17,702	7,128	180	2,369	11	-319	-50	-1,303	-701	-2,231	-1,273
Union City	1980	9,802	0.35	6,324	6,867	96	1,618	7	-319	-127	0	-351	-1,860	-654
Union City	1990	18,584	0.36	11,848	7,132	114	1,640	10	-319	-112	-556	-718	-1,492	-732
Union City	2000	17,724	0.38	11,002	7,761	149	1,541	11	-319	-52	-1,370	-1,029	-1,451	-832
Villa Rica	1980	6,686	0.42	3,854	7,577	70	1,104	7	-319	-127	0	-630	-1,269	-417
Villa Rica	1990	12,664	0.39	7,782	12,112	120	1,118	10	-319	-112	-476	-832	-1,016	-512
Villa Rica	2000	14,739	0.42	8,573	7,259	100	1,281	11	-319	-64	-866	-739	-1,206	-719
Waco	1980	7,076	0.40	4,220	7,478	68	1,168	7	-150	-127	0	-570	-1,343	-395
Waco	1990	14,998	0.39	9,171	7,469	71	1,324	10	-150	-112	-414	-382	-1,204	-536
Waco	2000	16,558	0.45	9,073	7,724	117	1,439	11	-150	-66	-870	-512	-1,355	-724
Waleska	1980	4,770	0.38	2,967	9,301	67	787	7	-319	-127	0	-343	-905	-289
Waleska	1990	17,554	0.37	11,001	10,141	64	1,549	10	-319	-112	67	-553	-1,409	-476
Waleska	2000	11,460	0.42	6,659	9,032	77	996	11	-319	-69	-133	-1,128	-938	-411
Walnut Grove	1980	5,951	0.36	3,804	6,425	71	982	7	-319	-127	0	-81	-1,129	-584
Walnut Grove	1990	15,180	0.35	9,847	6,219	79	1,340	10	-319	-112	128	-333	-1,218	-692
Walnut Grove	2000	21,973	0.35	14,284	6,458	143	1,910	11	-319	-28	-739	-385	-1,798	-1,302
Warm Springs	1980	6,819	0.42	3,971	7,526	78	1,125	7	-150	-127	0	-589	-1,294	-236
Warm Springs	1990	14,958	0.42	8,682	9,059	119	1,320	10	-150	-112	-1,123	-637	-1,201	-497
Warm Springs	2000	21,552	0.59	8,929	7,967	125	1,874	11	-150	-56	-2,032	-590	-1,764	-857
White	1980	6,244	0.36	4,009	6,936	63	1,030	7	-319	-127	0	-569	-1,185	-391
White	1990	11,994	0.37	7,602	7,423	65	1,059	10	-319	-112	-894	-1,588	-963	-412
White	2000	15,105	0.39	9,225	7,298	96	1,313	11	-319	-53	-1,143	-564	-1,236	-765
Whitesburg	1980	6,588	0.43	3,723	7,002	67	1,087	7	-319	-127	0	-524	-1,250	-375
Whitesburg	1990	11,675	0.40	7,011	6,590	62	1,030	10	-319	-112	-470	-506	-937	-472
Whitesburg	2000	14,615	0.44	8,237	7,907	102	1,270	11	-319	-77	-892	-277	-1,196	-775
Williamson	1980	6,560	0.32	4,487	7,248	63	1,083	7	-150	-127	0	-183	-1,245	-406
Williamson	1990	16,310	0.32	11,159	6,312	86	1,440	10	-150	-112	-1,089	-495	-1,309	-510
Williamson	2000	14,014	0.38	8,693	8,649	128	1,218	11	-150	-67	-498	-1,340	-1,147	-634

Continued on next page

Table 61 (continued)

Place	Year	A	B	C	D	E	F	G	H	I	J	K	L	M
Winder	1980	7,811	0.44	4,344	7,377	86	1,289	7	-319	-127	0	-193	-1,482	-350
Winder	1990	16,510	0.48	8,627	7,818	102	1,457	10	-319	-112	-691	-569	-1,325	-459
Winder	2000	17,621	0.45	9,618	7,757	134	1,532	11	-319	-49	-1,070	-799	-1,442	-789
Woodbury	1980	5,461	0.42	3,183	6,865	61	901	7	-150	-127	0	-785	-1,036	-288
Woodbury	1990	11,042	0.42	6,373	7,858	80	975	10	-150	-112	-732	-1,351	-886	-402
Woodbury	2000	12,527	0.43	7,161	8,775	114	1,089	11	-150	-81	-1,601	-1,741	-1,025	-561
Woodstock	1980	9,064	0.28	6,547	6,792	101	1,496	7	-319	-127	0	-343	-1,720	-792
Woodstock	1990	18,797	0.33	12,615	6,530	106	1,659	10	-319	-112	-283	-490	-1,509	-837
Woodstock	2000	26,354	0.34	17,375	6,881	180	2,291	11	-319	-32	-955	-384	-2,157	-1,361
Woolsey	1980	8,909	0.38	5,568	8,053	106	1,470	7	-319	-127	0	-707	-1,690	-863
Woolsey	1990	18,829	0.35	12,176	4,339	84	1,662	10	-319	-112	-677	-289	-1,511	-830
Woolsey	2000	43,442	0.58	18,196	7,208	172	3,776	11	-319	-73	-3,262	0	-3,556	-1,906
Zebulon	1980	7,656	0.40	4,605	7,770	102	1,263	7	-150	-127	0	-146	-1,453	-529
Zebulon	1990	13,810	0.42	8,006	7,487	94	1,219	10	-150	-112	9	-233	-1,108	-560
Zebulon	2000	13,155	0.41	7,735	7,620	121	1,144	11	-150	-59	-354	-976	-1,077	-573

Column headings refer to GPI alphabetical organization, see Section 5.2

Table 62: GPI Sub-measures by City, N-Y and Overall

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Acworth	1980	-1,710	-36	-70	-284	0	0	0	-6,080	-146	-168	0	-439	2,339
Acworth	1990	-1,711	-44	-70	-187	-57	0	0	-6,842	-163	-131	0	-401	6,222
Acworth	2000	-231	-96	-67	-144	-50	0	0	-7,119	-168	-6	0	-1,690	8,527
Aldora	1980	-214	-5	-44	-81	0	0	0	-6,080	-146	-168	0	-439	171
Aldora	1990	-216	-4	-44	-126	0	0	0	-6,842	-163	-131	0	-401	6,266
Aldora	2000	-422	-2	-36	-144	-39	0	0	-7,119	-168	-6	0	-1,690	2,900
Alpharetta	1980	-119	-33	-76	-194	0	0	0	-6,080	-146	-168	0	-439	5,500
Alpharetta	1990	-121	-129	-76	-181	-60	0	0	-6,842	-163	-131	0	-401	14,326
Alpharetta	2000	-148	-268	-75	-144	-49	0	0	-7,119	-168	-6	0	-1,690	15,772
Atlanta	1980	-424	-4,500	-76	-194	-97	0	0	-6,080	-146	-168	0	-439	-1,694
Atlanta	1990	-425	-3,633	-76	-181	-65	0	0	-6,842	-163	-131	0	-401	2,084
Atlanta	2000	-491	-3,207	-75	-144	-50	0	0	-7,119	-168	-6	0	-1,690	237
Auburn	1980	-193	-24	-65	-134	0	0	0	-6,080	-146	-168	0	-439	1,682
Auburn	1990	-194	-101	-65	-159	-63	0	0	-6,842	-163	-131	0	-401	8,058
Auburn	2000	-206	-180	-61	-144	-47	0	0	-7,119	-168	-6	0	-1,690	6,844
Austell	1980	-427	-39	-70	-284	-97	0	0	-6,080	-146	-168	0	-439	2,340
Austell	1990	-429	-37	-70	-187	-63	0	0	-6,842	-163	-131	0	-401	6,127
Austell	2000	-400	-38	-67	-144	-52	0	0	-7,119	-168	-6	0	-1,690	5,308
Avondale Estates	1980	-45	-17	-74	-176	-97	0	0	-6,080	-146	-168	0	-439	8,819
Avondale Estates	1990	-46	-30	-74	-184	-54	0	0	-6,842	-163	-131	0	-401	16,731
Avondale Estates	2000	-46	-24	-72	-144	-49	0	0	-7,119	-168	-6	0	-1,690	20,414
Ball Ground	1980	-182	-9	-47	-289	0	0	0	-6,080	-146	-168	0	-439	3,213
Ball Ground	1990	-184	-11	-47	-275	0	0	0	-6,842	-163	-131	0	-401	6,929
Ball Ground	2000	-296	-7	-40	-144	0	0	0	-7,119	-168	-6	0	-1,690	6,403
Barnesville	1980	-317	-151	-44	-81	0	0	0	-6,080	-146	-168	0	-439	2,632
Barnesville	1990	-318	-138	-44	-126	-60	0	0	-6,842	-163	-131	0	-401	4,266
Barnesville	2000	-230	-134	-36	-144	-49	0	0	-7,119	-168	-6	0	-1,690	3,078

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Berkeley Lake	1980	-778	-2	-48	-511	0	0	0	-6,080	-146	-168	0	-439	8,623
Berkeley Lake	1990	-780	-3	-48	-240	-65	0	0	-6,842	-163	-131	0	-401	22,098
Berkeley Lake	2000	-98	-5	-40	-144	-52	0	0	-7,119	-168	-6	0	-1,690	24,356
Bethlehem	1980	-451	-10	-65	-134	0	0	0	-6,080	-146	-168	0	-439	3,630
Bethlehem	1990	-453	-14	-65	-159	0	0	0	-6,842	-163	-131	0	-401	5,601
Bethlehem	2000	-224	-19	-61	-144	0	0	0	-7,119	-168	-6	0	-1,690	6,153
Bowdon	1980	-362	-25	-37	-96	0	0	0	-6,080	-146	-168	0	-439	3,767
Bowdon	1990	-363	-25	-37	-126	0	0	0	-6,842	-163	-131	0	-401	5,653
Bowdon	2000	-471	-21	-28	-144	0	0	0	-7,119	-168	-6	0	-1,690	3,750
Braswell	1980	-110	-4	-35	-375	0	0	0	-6,080	-146	-168	0	-439	2,450
Braswell	1990	-111	-1	-35	-332	0	0	0	-6,842	-163	-131	0	-401	25,936
Braswell	2000	-115	-1	-26	-144	0	0	0	-7,119	-168	-6	0	-1,690	6,050
Bremen	1980	-224	-82	-21	-86	0	0	0	-6,080	-146	-168	0	-439	4,031
Bremen	1990	-225	-79	-21	-121	-65	0	0	-6,842	-163	-131	0	-401	6,706
Bremen	2000	-378	-69	-8	-144	-42	0	0	-7,119	-168	-6	0	-1,690	5,443
Brooks	1980	-74	-5	-31	-692	0	0	0	-6,080	-146	-168	0	-439	4,303
Brooks	1990	-76	-7	-31	-270	0	0	0	-6,842	-163	-131	0	-401	10,787
Brooks	2000	-65	-9	-21	-144	0	0	0	-7,119	-168	-6	0	-1,690	12,553
Buchanan	1980	-386	-21	-21	-86	0	0	0	-6,080	-146	-168	0	-439	2,975
Buchanan	1990	-388	-18	-21	-121	0	0	0	-6,842	-163	-131	0	-401	5,134
Buchanan	2000	-435	-14	-8	-144	0	0	0	-7,119	-168	-6	0	-1,690	3,458
Buford	1980	-151	-26	-48	-511	0	0	0	-6,080	-146	-168	0	-439	2,884
Buford	1990	-152	-30	-48	-240	-64	0	0	-6,842	-163	-131	0	-401	6,357
Buford	2000	-252	-30	-40	-144	-46	0	0	-7,119	-168	-6	0	-1,690	5,306
Canton	1980	-310	-49	-47	-289	0	0	0	-6,080	-146	-168	0	-439	3,954
Canton	1990	-311	-68	-47	-275	-54	0	0	-6,842	-163	-131	0	-401	5,672
Canton	2000	-260	-76	-40	-144	-49	0	0	-7,119	-168	-6	0	-1,690	6,094
Carl	1980	-451	-9	-65	-134	0	0	0	-6,080	-146	-168	0	-439	3,714
Carl	1990	-453	-8	-65	-159	0	0	0	-6,842	-163	-131	0	-401	7,134

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Carl	2000	-224	-5	-61	-144	-19	0	0	-7,119	-168	-6	0	-1,690	11,812
Carrollton	1980	-288	-206	-37	-96	0	0	0	-6,080	-146	-168	0	-439	3,324
Carrollton	1990	-289	-209	-37	-126	-64	0	0	-6,842	-163	-131	0	-401	5,884
Carrollton	2000	-292	-211	-28	-144	-48	0	0	-7,119	-168	-6	0	-1,690	4,131
Cartersville	1980	-291	-197	-47	-937	0	0	0	-6,080	-146	-168	0	-439	3,029
Cartersville	1990	-292	-231	-47	-392	-61	0	0	-6,842	-163	-131	0	-401	6,945
Cartersville	2000	-300	-240	-40	-144	-49	0	0	-7,119	-168	-6	0	-1,690	5,999
Centralhatchee	1980	-112	-5	-44	-105	0	0	0	-6,080	-146	-168	0	-439	4,850
Centralhatchee	1990	-113	-7	-44	-132	0	0	0	-6,842	-163	-131	0	-401	6,322
Centralhatchee	2000	-148	-6	-36	-144	0	0	0	-7,119	-168	-6	0	-1,690	5,791
Chamblee	1980	-45	-90	-74	-176	-97	0	0	-6,080	-146	-168	0	-439	4,891
Chamblee	1990	-46	-84	-74	-184	-65	0	0	-6,842	-163	-131	0	-401	5,730
Chamblee	2000	-46	-87	-72	-144	-51	0	0	-7,119	-168	-6	0	-1,690	4,388
Clarkston	1980	-45	-57	-74	-176	-97	0	0	-6,080	-146	-168	0	-439	5,457
Clarkston	1990	-46	-59	-74	-184	-65	0	0	-6,842	-163	-131	0	-401	10,159
Clarkston	2000	-46	-66	-72	-144	-47	0	0	-7,119	-168	-6	0	-1,690	4,305
College Park	1980	-290	-261	-76	-194	-97	0	0	-6,080	-146	-168	0	-439	3,560
College Park	1990	-291	-184	-76	-181	-66	0	0	-6,842	-163	-131	0	-401	5,190
College Park	2000	-287	-157	-75	-144	-51	0	0	-7,119	-168	-6	0	-1,690	2,946
Concord	1980	-346	-5	-29	-96	0	0	0	-6,080	-146	-168	0	-439	2,600
Concord	1990	-347	-3	-29	-138	0	0	0	-6,842	-163	-131	0	-401	6,162
Concord	2000	-374	-4	-18	-144	0	0	0	-7,119	-168	-6	0	-1,690	7,210
Conyers	1980	-296	-274	-73	-182	-97	0	0	-6,080	-146	-168	0	-439	3,634
Conyers	1990	-297	-306	-73	-228	-57	0	0	-6,842	-163	-131	0	-401	6,096
Conyers	2000	-226	-325	-70	-144	-52	0	0	-7,119	-168	-6	0	-1,690	5,284
Covington	1980	-2,235	-267	-73	-111	0	0	0	-6,080	-146	-168	0	-439	572
Covington	1990	-2,237	-217	-73	-154	-66	0	0	-6,842	-163	-131	0	-401	2,991
Covington	2000	-589	-212	-71	-144	-47	0	0	-7,119	-168	-6	0	-1,690	3,355
Cumming	1980	-969	-46	-44	-221	0	0	0	-6,080	-146	-168	0	-439	2,039

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Cumming	1990	-970	-59	-44	-231	-61	0	0	-6,842	-163	-131	0	-401	6,396
Cumming	2000	-1,390	-69	-36	-144	-51	0	0	-7,119	-168	-6	0	-1,690	4,965
Dacula	1980	-142	-6	-48	-511	0	0	0	-6,080	-146	-168	0	-439	2,595
Dacula	1990	-143	-8	-48	-240	0	0	0	-6,842	-163	-131	0	-401	9,789
Dacula	2000	-98	-11	-40	-144	-50	0	0	-7,119	-168	-6	0	-1,690	9,218
Dallas	1980	-169	-34	-35	-375	0	0	0	-6,080	-146	-168	0	-439	3,339
Dallas	1990	-170	-37	-35	-332	-55	0	0	-6,842	-163	-131	0	-401	4,093
Dallas	2000	-214	-50	-26	-144	-49	0	0	-7,119	-168	-6	0	-1,690	4,561
Dawsonville	1980	-440	-24	-73	-638	0	0	0	-6,080	-146	-168	0	-439	2,176
Dawsonville	1990	-441	-25	-73	-284	0	0	0	-6,842	-163	-131	0	-401	4,654
Dawsonville	2000	-497	-27	-71	-144	0	0	0	-7,119	-168	-6	0	-1,690	4,233
Decatur	1980	-49	-232	-74	-176	-97	0	0	-6,080	-146	-168	0	-439	4,814
Decatur	1990	-51	-190	-74	-184	-65	0	0	-6,842	-163	-131	0	-401	9,519
Decatur	2000	-53	-166	-72	-144	-50	0	0	-7,119	-168	-6	0	-1,690	11,124
Doraville	1980	-45	-93	-74	-176	-97	0	0	-6,080	-146	-168	0	-439	4,323
Doraville	1990	-46	-84	-74	-184	-65	0	0	-6,842	-163	-131	0	-401	10,909
Doraville	2000	-46	-90	-72	-144	-51	0	0	-7,119	-168	-6	0	-1,690	4,914
Douglasville	1980	-156	-242	-60	-369	-97	0	0	-6,080	-146	-168	0	-439	2,838
Douglasville	1990	-157	-351	-60	-175	-60	0	0	-6,842	-163	-131	0	-401	6,723
Douglasville	2000	-156	-463	-56	-144	-48	0	0	-7,119	-168	-6	0	-1,690	5,823
Duluth	1980	-119	-11	-48	-511	0	0	0	-6,080	-146	-168	0	-439	4,446
Duluth	1990	-120	-34	-48	-240	-58	0	0	-6,842	-163	-131	0	-401	13,755
Duluth	2000	-98	-62	-40	-144	-50	0	0	-7,119	-168	-6	0	-1,690	13,900
East Point	1980	-554	-397	-76	-194	-97	0	0	-6,080	-146	-168	0	-439	3,412
East Point	1990	-555	-318	-76	-181	-65	0	0	-6,842	-163	-131	0	-401	6,363
East Point	2000	-168	-305	-75	-144	-50	0	0	-7,119	-168	-6	0	-1,690	3,036
Emerson	1980	-270	-23	-47	-937	0	0	0	-6,080	-146	-168	0	-439	1,493
Emerson	1990	-271	-19	-47	-392	0	0	0	-6,842	-163	-131	0	-401	6,659
Emerson	2000	-239	-16	-40	-144	-37	0	0	-7,119	-168	-6	0	-1,690	4,611

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Ephesus	1980	-245	-4	-44	-105	0	0	0	-6,080	-146	-168	0	-439	3,009
Ephesus	1990	-247	-6	-44	-132	0	0	0	-6,842	-163	-131	0	-401	4,106
Ephesus	2000	-346	-6	-36	-144	0	0	0	-7,119	-168	-6	0	-1,690	4,982
Euharlee	1980	-220	-10	-47	-937	0	0	0	-6,080	-146	-168	0	-439	1,514
Euharlee	1990	-221	-15	-47	-392	0	0	0	-6,842	-163	-131	0	-401	6,824
Euharlee	2000	-205	-48	-40	-144	-45	0	0	-7,119	-168	-6	0	-1,690	6,773
Fairburn	1980	-716	-37	-76	-194	-97	0	0	-6,080	-146	-168	0	-439	3,131
Fairburn	1990	-717	-42	-76	-181	-57	0	0	-6,842	-163	-131	0	-401	6,728
Fairburn	2000	-215	-42	-75	-144	-45	0	0	-7,119	-168	-6	0	-1,690	5,187
Fayetteville	1980	-340	-64	-31	-692	0	0	0	-6,080	-146	-168	0	-439	3,957
Fayetteville	1990	-341	-115	-31	-270	-68	0	0	-6,842	-163	-131	0	-401	11,481
Fayetteville	2000	-302	-191	-21	-144	-49	0	0	-7,119	-168	-6	0	-1,690	11,051
Flovilla	1980	-238	-17	-35	-89	0	0	0	-6,080	-146	-168	0	-439	1,871
Flovilla	1990	-239	-20	-35	-132	0	0	0	-6,842	-163	-131	0	-401	3,466
Flovilla	2000	-330	-18	-25	-144	0	0	0	-7,119	-168	-6	0	-1,690	3,363
Forest Park	1980	-458	-573	-82	-98	-97	0	0	-6,080	-146	-168	0	-439	3,511
Forest Park	1990	-459	-462	-82	-134	-64	0	0	-6,842	-163	-131	0	-401	6,778
Forest Park	2000	-55	-476	-82	-144	-49	0	0	-7,119	-168	-6	0	-1,690	3,097
Franklin	1980	-46	-15	-44	-105	0	0	0	-6,080	-146	-168	0	-439	4,325
Franklin	1990	-47	-16	-44	-132	0	0	0	-6,842	-163	-131	0	-401	5,013
Franklin	2000	-53	-14	-36	-144	0	0	0	-7,119	-168	-6	0	-1,690	3,399
Gay	1980	-184	-3	-24	-66	0	0	0	-6,080	-146	-168	0	-439	5,697
Gay	1990	-185	-2	-24	-103	0	0	0	-6,842	-163	-131	0	-401	8,257
Gay	2000	-319	-2	-12	-144	0	0	0	-7,119	-168	-6	0	-1,690	4,489
Good Hope	1980	-714	-3	-61	-122	0	0	0	-6,080	-146	-168	0	-439	3,988
Good Hope	1990	-715	-3	-61	-164	0	0	0	-6,842	-163	-131	0	-401	8,297
Good Hope	2000	-197	-3	-56	-144	0	0	0	-7,119	-168	-6	0	-1,690	9,818
Grantville	1980	-130	-19	-47	-74	0	0	0	-6,080	-146	-168	0	-439	3,009
Grantville	1990	-131	-17	-47	-166	0	0	0	-6,842	-163	-131	0	-401	4,930

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Grantville	2000	-156	-16	-40	-144	0	0	0	-7,119	-168	-6	0	-1,690	3,596
Grayson	1980	-130	-2	-48	-511	0	0	0	-6,080	-146	-168	0	-439	3,093
Grayson	1990	-131	-2	-48	-240	0	0	0	-6,842	-163	-131	0	-401	9,091
Grayson	2000	-98	-2	-40	-144	-51	0	0	-7,119	-168	-6	0	-1,690	8,328
Greenville	1980	-190	-18	-24	-66	0	0	0	-6,080	-146	-168	0	-439	2,469
Greenville	1990	-191	-15	-24	-103	0	0	0	-6,842	-163	-131	0	-401	3,624
Greenville	2000	-513	-10	-12	-144	0	0	0	-7,119	-168	-6	0	-1,690	2,292
Griffin	1980	-679	-758	-36	-149	0	0	0	-6,080	-146	-168	0	-439	2,010
Griffin	1990	-680	-693	-36	-308	-65	0	0	-6,842	-163	-131	0	-401	4,002
Griffin	2000	-427	-624	-27	-144	-49	0	0	-7,119	-168	-6	0	-1,690	2,788
Hampton	1980	-129	-42	-62	-293	0	0	0	-6,080	-146	-168	0	-439	3,387
Hampton	1990	-131	-47	-62	-224	-64	0	0	-6,842	-163	-131	0	-401	5,907
Hampton	2000	-208	-58	-57	-144	-49	0	0	-7,119	-168	-6	0	-1,690	7,000
Hapeville	1980	-5,348	-65	-76	-194	-97	0	0	-6,080	-146	-168	0	-439	-105
Hapeville	1990	-5,349	-51	-76	-181	-65	0	0	-6,842	-163	-131	0	-401	3,186
Hapeville	2000	-445	-48	-75	-144	-50	0	0	-7,119	-168	-6	0	-1,690	5,195
Haralson	1980	-178	-2	-47	-74	0	0	0	-6,080	-146	-168	0	-439	3,953
Haralson	1990	-180	-2	-47	-166	0	0	0	-6,842	-163	-131	0	-401	5,821
Haralson	2000	-73	-2	-40	-144	0	0	0	-7,119	-168	-6	0	-1,690	6,214
Hiram	1980	-117	-14	-35	-375	0	0	0	-6,080	-146	-168	0	-439	1,511
Hiram	1990	-119	-18	-35	-332	0	0	0	-6,842	-163	-131	0	-401	5,939
Hiram	2000	-87	-14	-26	-144	-45	0	0	-7,119	-168	-6	0	-1,690	6,788
Holly Springs	1980	-419	-9	-47	-289	0	0	0	-6,080	-146	-168	0	-439	4,183
Holly Springs	1990	-420	-32	-47	-275	0	0	0	-6,842	-163	-131	0	-401	9,644
Holly Springs	2000	-132	-32	-40	-144	-48	0	0	-7,119	-168	-6	0	-1,690	11,118
Jackson	1980	-1,614	-154	-35	-89	0	0	0	-6,080	-146	-168	0	-439	1,434
Jackson	1990	-1,615	-144	-35	-132	-60	0	0	-6,842	-163	-131	0	-401	3,619
Jackson	2000	-153	-107	-25	-144	-44	0	0	-7,119	-168	-6	0	-1,690	4,310
Jasper	1980	-252	-50	-32	-124	0	0	0	-6,080	-146	-168	0	-439	3,827

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Jasper	1990	-253	-55	-32	-166	0	0	0	-6,842	-163	-131	0	-401	6,326
Jasper	2000	-381	-50	-22	-144	-44	0	0	-7,119	-168	-6	0	-1,690	6,528
Jenkinsburg	1980	-386	-12	-35	-89	0	0	0	-6,080	-146	-168	0	-439	5,386
Jenkinsburg	1990	-387	-7	-35	-132	0	0	0	-6,842	-163	-131	0	-401	7,082
Jenkinsburg	2000	-414	-6	-25	-144	0	0	0	-7,119	-168	-6	0	-1,690	6,189
Jonesboro	1980	-1,936	-126	-82	-98	-97	0	0	-6,080	-146	-168	0	-439	2,049
Jonesboro	1990	-1,937	-111	-82	-134	-57	0	0	-6,842	-163	-131	0	-401	3,667
Jonesboro	2000	-55	-85	-82	-144	-50	0	0	-7,119	-168	-6	0	-1,690	5,192
Kennesaw	1980	-2,753	-50	-70	-284	-97	0	0	-6,080	-146	-168	0	-439	1,188
Kennesaw	1990	-2,754	-78	-70	-187	-64	0	0	-6,842	-163	-131	0	-401	8,158
Kennesaw	2000	-130	-155	-67	-144	-50	0	0	-7,119	-168	-6	0	-1,690	11,538
Kingston	1980	-319	-15	-47	-937	0	0	0	-6,080	-146	-168	0	-439	1,210
Kingston	1990	-320	-11	-47	-392	0	0	0	-6,842	-163	-131	0	-401	5,746
Kingston	2000	-327	-10	-40	-144	0	0	0	-7,119	-168	-6	0	-1,690	5,831
Lake City	1980	-2,003	-90	-82	-98	-97	0	0	-6,080	-146	-168	0	-439	3,298
Lake City	1990	-2,005	-75	-82	-134	-66	0	0	-6,842	-163	-131	0	-401	10,286
Lake City	2000	-55	-64	-82	-144	-49	0	0	-7,119	-168	-6	0	-1,690	7,113
Lawrenceville	1980	-1,834	-35	-48	-511	-97	0	0	-6,080	-146	-168	0	-439	1,553
Lawrenceville	1990	-1,835	-59	-48	-240	-63	0	0	-6,842	-163	-131	0	-401	7,382
Lawrenceville	2000	-163	-63	-40	-144	-50	0	0	-7,119	-168	-6	0	-1,690	6,845
Lilburn	1980	-778	-15	-48	-511	-97	0	0	-6,080	-146	-168	0	-439	4,027
Lilburn	1990	-780	-31	-48	-240	-65	0	0	-6,842	-163	-131	0	-401	11,308
Lilburn	2000	-98	-32	-40	-144	-50	0	0	-7,119	-168	-6	0	-1,690	9,317
Lithonia	1980	-45	-33	-74	-176	-97	0	0	-6,080	-146	-168	0	-439	1,742
Lithonia	1990	-46	-27	-74	-184	-58	0	0	-6,842	-163	-131	0	-401	2,803
Lithonia	2000	-46	-20	-72	-144	-51	0	0	-7,119	-168	-6	0	-1,690	1,081
Locust Grove	1980	-147	-30	-62	-293	0	0	0	-6,080	-146	-168	0	-439	3,264
Locust Grove	1990	-149	-30	-62	-224	0	0	0	-6,842	-163	-131	0	-401	7,793
Locust Grove	2000	-280	-35	-57	-144	-48	0	0	-7,119	-168	-6	0	-1,690	5,227

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Loganville	1980	-3,106	-31	-61	-122	0	0	0	-6,080	-146	-168	0	-439	281
Loganville	1990	-3,108	-46	-61	-164	-56	0	0	-6,842	-163	-131	0	-401	4,164
Loganville	2000	-346	-65	-56	-144	-46	0	0	-7,119	-168	-6	0	-1,690	8,152
Lone Oak	1980	-213	-2	-24	-66	0	0	0	-6,080	-146	-168	0	-439	3,471
Lone Oak	1990	-214	-2	-24	-103	0	0	0	-6,842	-163	-131	0	-401	8,370
Lone Oak	2000	-581	-1	-12	-144	0	0	0	-7,119	-168	-6	0	-1,690	7,041
Lovejoy	1980	-2,003	-6	-82	-98	0	0	0	-6,080	-146	-168	0	-439	2,195
Lovejoy	1990	-2,005	-20	-82	-134	0	0	0	-6,842	-163	-131	0	-401	-9,648
Lovejoy	2000	-55	-55	-82	-144	-48	0	0	-7,119	-168	-6	0	-1,690	1,534
Luthersville	1980	-143	-10	-24	-66	0	0	0	-6,080	-146	-168	0	-439	2,371
Luthersville	1990	-145	-10	-24	-103	0	0	0	-6,842	-163	-131	0	-401	3,760
Luthersville	2000	-174	-9	-12	-144	0	0	0	-7,119	-168	-6	0	-1,690	1,692
Manchester	1980	-1,202	-73	-24	-66	0	0	0	-6,080	-146	-168	0	-439	2,924
Manchester	1990	-1,203	-54	-24	-103	-66	0	0	-6,842	-163	-131	0	-401	4,752
Manchester	2000	-281	-44	-12	-144	-48	0	0	-7,119	-168	-6	0	-1,690	2,587
Mansfield	1980	-129	-12	-73	-111	0	0	0	-6,080	-146	-168	0	-439	3,085
Mansfield	1990	-130	-8	-73	-154	0	0	0	-6,842	-163	-131	0	-401	7,825
Mansfield	2000	-302	-7	-71	-144	0	0	0	-7,119	-168	-6	0	-1,690	5,188
Marietta	1980	-3,797	-302	-70	-284	-97	0	0	-6,080	-146	-168	0	-439	925
Marietta	1990	-3,798	-389	-70	-187	-63	0	0	-6,842	-163	-131	0	-401	5,747
Marietta	2000	-311	-419	-67	-144	-49	0	0	-7,119	-168	-6	0	-1,690	7,095
McDonough	1980	-926	-55	-62	-293	0	0	0	-6,080	-146	-168	0	-439	3,026
McDonough	1990	-927	-52	-62	-224	-69	0	0	-6,842	-163	-131	0	-401	7,317
McDonough	2000	-223	-127	-57	-144	-46	0	0	-7,119	-168	-6	0	-1,690	6,814
Meansville	1980	-87	-5	-29	-96	0	0	0	-6,080	-146	-168	0	-439	3,337
Meansville	1990	-88	-4	-29	-138	0	0	0	-6,842	-163	-131	0	-401	6,086
Meansville	2000	-182	-2	-18	-144	0	0	0	-7,119	-168	-6	0	-1,690	7,489
Milner	1980	-282	-11	-44	-81	0	0	0	-6,080	-146	-168	0	-439	3,325
Milner	1990	-283	-11	-44	-126	0	0	0	-6,842	-163	-131	0	-401	5,706

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Milner	2000	-271	-12	-36	-144	-24	0	0	-7,119	-168	-6	0	-1,690	5,052
Molena	1980	-73	-7	-29	-96	0	0	0	-6,080	-146	-168	0	-439	2,564
Molena	1990	-75	-7	-29	-138	0	0	0	-6,842	-163	-131	0	-401	5,110
Molena	2000	-111	-6	-18	-144	0	0	0	-7,119	-168	-6	0	-1,690	5,326
Monroe	1980	-134	-145	-61	-122	0	0	0	-6,080	-146	-168	0	-439	2,532
Monroe	1990	-136	-141	-61	-164	-65	0	0	-6,842	-163	-131	0	-401	4,180
Monroe	2000	-227	-136	-56	-144	-50	0	0	-7,119	-168	-6	0	-1,690	3,216
Monticello	1980	-1,775	-69	-29	-94	0	0	0	-6,080	-146	-168	0	-439	1,866
Monticello	1990	-1,776	-63	-29	-139	0	0	0	-6,842	-163	-131	0	-401	3,236
Monticello	2000	-302	-52	-18	-144	0	0	0	-7,119	-168	-6	0	-1,690	4,453
Moreland	1980	-188	-6	-47	-74	0	0	0	-6,080	-146	-168	0	-439	4,712
Moreland	1990	-189	-4	-47	-166	0	0	0	-6,842	-163	-131	0	-401	8,467
Moreland	2000	-111	-5	-40	-144	0	0	0	-7,119	-168	-6	0	-1,690	7,083
Morrow	1980	-2,003	-116	-82	-98	-97	0	0	-6,080	-146	-168	0	-439	4,507
Morrow	1990	-2,005	-115	-82	-134	-77	0	0	-6,842	-163	-131	0	-401	11,383
Morrow	2000	-55	-108	-82	-144	-50	0	0	-7,119	-168	-6	0	-1,690	5,955
Mount Zion	1980	-190	-6	-37	-96	0	0	0	-6,080	-146	-168	0	-439	2,709
Mount Zion	1990	-191	-10	-37	-126	0	0	0	-6,842	-163	-131	0	-401	4,243
Mount Zion	2000	-188	-14	-28	-144	0	0	0	-7,119	-168	-6	0	-1,690	5,249
Mountain Park	1980	-137	-4	-76	-194	-97	0	0	-6,080	-146	-168	0	-439	5,972
Mountain Park	1990	-139	-5	-76	-181	-75	0	0	-6,842	-163	-131	0	-401	14,829
Mountain Park	2000	-306	-4	-75	-144	-47	0	0	-7,119	-168	-6	0	-1,690	11,713
Nelson	1980	-114	-18	-32	-124	0	0	0	-6,080	-146	-168	0	-439	2,502
Nelson	1990	-115	-13	-32	-166	0	0	0	-6,842	-163	-131	0	-401	6,598
Nelson	2000	-157	-15	-22	-144	0	0	0	-7,119	-168	-6	0	-1,690	9,690
Newborn	1980	-137	-10	-73	-111	0	0	0	-6,080	-146	-168	0	-439	1,907
Newborn	1990	-138	-9	-73	-154	0	0	0	-6,842	-163	-131	0	-401	4,273
Newborn	2000	-131	-10	-71	-144	0	0	0	-7,119	-168	-6	0	-1,690	5,603
Newnan	1980	-178	-191	-47	-74	0	0	0	-6,080	-146	-168	0	-439	3,136

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Newnan	1990	-180	-184	-47	-166	-65	0	0	-6,842	-163	-131	0	-401	5,521
Newnan	2000	-111	-196	-40	-144	-47	0	0	-7,119	-168	-6	0	-1,690	4,651
Norcross	1980	-1,143	-13	-48	-511	-97	0	0	-6,080	-146	-168	0	-439	3,762
Norcross	1990	-1,145	-18	-48	-240	-71	0	0	-6,842	-163	-131	0	-401	10,497
Norcross	2000	-301	-24	-40	-144	-49	0	0	-7,119	-168	-6	0	-1,690	5,958
Orchard Hill	1980	-256	-7	-36	-149	0	0	0	-6,080	-146	-168	0	-439	2,280
Orchard Hill	1990	-257	-8	-36	-308	0	0	0	-6,842	-163	-131	0	-401	5,558
Orchard Hill	2000	-173	-6	-27	-144	0	0	0	-7,119	-168	-6	0	-1,690	5,117
Oxford	1980	-151	-44	-73	-111	0	0	0	-6,080	-146	-168	0	-439	3,718
Oxford	1990	-152	-45	-73	-154	0	0	0	-6,842	-163	-131	0	-401	6,554
Oxford	2000	-204	-35	-71	-144	-45	0	0	-7,119	-168	-6	0	-1,690	794
Palmetto	1980	-1,340	-22	-76	-194	0	0	0	-6,080	-146	-168	0	-439	2,587
Palmetto	1990	-1,341	-24	-76	-181	-67	0	0	-6,842	-163	-131	0	-401	5,951
Palmetto	2000	-277	-26	-75	-144	-43	0	0	-7,119	-168	-6	0	-1,690	3,695
Peachtree City	1980	-110	-151	-31	-692	0	0	0	-6,080	-146	-168	0	-439	5,445
Peachtree City	1990	-111	-390	-31	-270	-65	0	0	-6,842	-163	-131	0	-401	14,161
Peachtree City	2000	-115	-541	-21	-144	-50	0	0	-7,119	-168	-6	0	-1,690	14,441
Pine Lake	1980	-45	-11	-74	-176	-97	0	0	-6,080	-146	-168	0	-439	3,417
Pine Lake	1990	-46	-9	-74	-184	-60	0	0	-6,842	-163	-131	0	-401	6,995
Pine Lake	2000	-46	-6	-72	-144	-45	0	0	-7,119	-168	-6	0	-1,690	10,094
Porterdale	1980	-416	-37	-73	-111	0	0	0	-6,080	-146	-168	0	-439	3,525
Porterdale	1990	-418	-28	-73	-154	0	0	0	-6,842	-163	-131	0	-401	4,970
Porterdale	2000	-234	-24	-71	-144	-45	0	0	-7,119	-168	-6	0	-1,690	2,747
Powder Springs	1980	-2,870	-33	-70	-284	-97	0	0	-6,080	-146	-168	0	-439	811
Powder Springs	1990	-2,872	-59	-70	-187	-65	0	0	-6,842	-163	-131	0	-401	7,994
Powder Springs	2000	-283	-89	-67	-144	-52	0	0	-7,119	-168	-6	0	-1,690	8,521
Riverdale	1980	-9,493	-217	-82	-98	-97	0	0	-6,080	-146	-168	0	-439	-4,541
Riverdale	1990	-9,495	-262	-82	-134	-62	0	0	-6,842	-163	-131	0	-401	-139
Riverdale	2000	-101	-277	-82	-144	-50	0	0	-7,119	-168	-6	0	-1,690	4,214

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Roopville	1980	-98	-3	-37	-96	0	0	0	-6,080	-146	-168	0	-439	2,787
Roopville	1990	-99	-3	-37	-126	0	0	0	-6,842	-163	-131	0	-401	5,250
Roopville	2000	-130	-2	-28	-144	0	0	0	-7,119	-168	-6	0	-1,690	9,780
Roswell	1980	-375	-247	-76	-194	-97	0	0	-6,080	-146	-168	0	-439	6,007
Roswell	1990	-376	-451	-76	-181	-64	0	0	-6,842	-163	-131	0	-401	16,175
Roswell	2000	-69	-611	-75	-144	-50	0	0	-7,119	-168	-6	0	-1,690	15,120
Sandy Springs	1980	-979	-496	-76	-194	-97	0	0	-6,080	-146	-168	0	-439	7,510
Sandy Springs	1990	-980	-626	-76	-181	-65	0	0	-6,842	-163	-131	0	-401	18,491
Sandy Springs	2000	-253	-659	-75	-144	-50	0	0	-7,119	-168	-6	0	-1,690	16,813
Senoia	1980	-666	-15	-47	-74	0	0	0	-6,080	-146	-168	0	-439	2,357
Senoia	1990	-667	-14	-47	-166	0	0	0	-6,842	-163	-131	0	-401	5,267
Senoia	2000	-239	-21	-40	-144	0	0	0	-7,119	-168	-6	0	-1,690	7,629
Shady Dale	1980	-194	-5	-29	-94	0	0	0	-6,080	-146	-168	0	-439	4,124
Shady Dale	1990	-195	-4	-29	-139	0	0	0	-6,842	-163	-131	0	-401	7,818
Shady Dale	2000	-196	-5	-18	-144	0	0	0	-7,119	-168	-6	0	-1,690	3,541
Sharpsburg	1980	-178	-3	-47	-74	0	0	0	-6,080	-146	-168	0	-439	3,047
Sharpsburg	1990	-180	-3	-47	-166	0	0	0	-6,842	-163	-131	0	-401	8,274
Sharpsburg	2000	-111	-4	-40	-144	-46	0	0	-7,119	-168	-6	0	-1,690	11,451
Smyrna	1980	-366	-199	-70	-284	-97	0	0	-6,080	-146	-168	0	-439	5,097
Smyrna	1990	-367	-286	-70	-187	-60	0	0	-6,842	-163	-131	0	-401	12,935
Smyrna	2000	-220	-292	-67	-144	-49	0	0	-7,119	-168	-6	0	-1,690	10,652
Snellville	1980	-778	-33	-48	-511	-97	0	0	-6,080	-146	-168	0	-439	4,686
Snellville	1990	-780	-41	-48	-240	-64	0	0	-6,842	-163	-131	0	-401	12,417
Snellville	2000	-98	-43	-40	-144	-48	0	0	-7,119	-168	-6	0	-1,690	12,479
Social Circle	1980	-239	-43	-61	-122	0	0	0	-6,080	-146	-168	0	-439	2,887
Social Circle	1990	-240	-39	-61	-164	-67	0	0	-6,842	-163	-131	0	-401	6,945
Social Circle	2000	-322	-40	-56	-144	0	0	0	-7,119	-168	-6	0	-1,690	4,747
Statham	1980	-330	-41	-65	-134	0	0	0	-6,080	-146	-168	0	-439	2,856
Statham	1990	-332	-44	-65	-159	0	0	0	-6,842	-163	-131	0	-401	5,171

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Statham	2000	-316	-53	-61	-144	0	0	0	-7,119	-168	-6	0	-1,690	5,719
Stockbridge	1980	-199	-43	-62	-293	-97	0	0	-6,080	-146	-168	0	-439	3,856
Stockbridge	1990	-200	-71	-62	-224	-55	0	0	-6,842	-163	-131	0	-401	8,405
Stockbridge	2000	-184	-147	-57	-144	-48	0	0	-7,119	-168	-6	0	-1,690	8,393
Stone Mountain	1980	-45	-61	-74	-176	-97	0	0	-6,080	-146	-168	0	-439	4,773
Stone Mountain	1990	-46	-62	-74	-184	-75	0	0	-6,842	-163	-131	0	-401	10,667
Stone Mountain	2000	-46	-65	-72	-144	-48	0	0	-7,119	-168	-6	0	-1,690	5,547
Sugar Hill	1980	-4,857	-9	-48	-511	0	0	0	-6,080	-146	-168	0	-439	-1,410
Sugar Hill	1990	-4,858	-16	-48	-240	-63	0	0	-6,842	-163	-131	0	-401	4,233
Sugar Hill	2000	-98	-32	-40	-144	-49	0	0	-7,119	-168	-6	0	-1,690	10,008
Sunny Side	1980	-1,031	-62	-36	-149	0	0	0	-6,080	-146	-168	0	-439	29,602
Sunny Side	1990	-257	-7	-36	-308	0	0	0	-6,842	-163	-131	0	-401	56,819
Sunny Side	2000	-173	-4	-27	-144	-437	0	0	-7,119	-168	-6	0	-1,690	65,016
Suwanee	1980	-53	-4	-48	-511	0	0	0	-6,080	-146	-168	0	-439	3,819
Suwanee	1990	-54	-8	-48	-240	0	0	0	-6,842	-163	-131	0	-401	12,574
Suwanee	2000	-51	-25	-40	-144	-50	0	0	-7,119	-168	-6	0	-1,690	15,944
Talking Rock	1980	-114	-3	-32	-124	0	0	0	-6,080	-146	-168	0	-439	2,927
Talking Rock	1990	-115	-2	-32	-166	0	0	0	-6,842	-163	-131	0	-401	5,313
Talking Rock	2000	-46	-1	-22	-144	0	0	0	-7,119	-168	-6	0	-1,690	11,454
Tallapoosa	1980	-2,578	-55	-21	-86	0	0	0	-6,080	-146	-168	0	-439	1,109
Tallapoosa	1990	-2,579	-49	-21	-121	-66	0	0	-6,842	-163	-131	0	-401	4,769
Tallapoosa	2000	-328	-42	-8	-144	0	0	0	-7,119	-168	-6	0	-1,690	5,412
Temple	1980	-117	-22	-37	-96	0	0	0	-6,080	-146	-168	0	-439	3,244
Temple	1990	-118	-24	-37	-126	0	0	0	-6,842	-163	-131	0	-401	5,412
Temple	2000	-256	-25	-28	-144	-27	0	0	-7,119	-168	-6	0	-1,690	5,731
Turin	1980	-130	-4	-47	-74	0	0	0	-6,080	-146	-168	0	-439	2,713
Turin	1990	-132	-3	-47	-166	0	0	0	-6,842	-163	-131	0	-401	10,285
Turin	2000	-170	-2	-40	-144	0	0	0	-7,119	-168	-6	0	-1,690	10,129
Tyrone	1980	-110	-24	-31	-692	0	0	0	-6,080	-146	-168	0	-439	4,054

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Tyrone	1990	-111	-60	-31	-270	-61	0	0	-6,842	-163	-131	0	-401	12,126
Tyrone	2000	-48	-67	-21	-144	-41	0	0	-7,119	-168	-6	0	-1,690	12,211
Union City	1980	-486	-51	-76	-194	-97	0	0	-6,080	-146	-168	0	-439	3,865
Union City	1990	-487	-83	-76	-181	-61	0	0	-6,842	-163	-131	0	-401	8,391
Union City	2000	-120	-89	-75	-144	-49	0	0	-7,119	-168	-6	0	-1,690	5,952
Villa Rica	1980	-1,291	-50	-37	-96	0	0	0	-6,080	-146	-168	0	-439	1,541
Villa Rica	1990	-1,293	-50	-37	-126	-109	0	0	-6,842	-163	-131	0	-401	8,724
Villa Rica	2000	-337	-44	-28	-144	-41	0	0	-7,119	-168	-6	0	-1,690	3,735
Waco	1980	-142	-10	-21	-86	0	0	0	-6,080	-146	-168	0	-439	3,265
Waco	1990	-143	-8	-21	-121	0	0	0	-6,842	-163	-131	0	-401	7,416
Waco	2000	-231	-7	-8	-144	-14	0	0	-7,119	-168	-6	0	-1,690	5,298
Waleska	1980	-569	-6	-47	-289	0	0	0	-6,080	-146	-168	0	-439	3,402
Waleska	1990	-571	-8	-47	-275	0	0	0	-6,842	-163	-131	0	-401	11,526
Waleska	2000	-649	-6	-40	-144	0	0	0	-7,119	-168	-6	0	-1,690	3,955
Walnut Grove	1980	-714	-6	-61	-122	0	0	0	-6,080	-146	-168	0	-439	1,313
Walnut Grove	1990	-715	-7	-61	-164	0	0	0	-6,842	-163	-131	0	-401	6,466
Walnut Grove	2000	-197	-15	-56	-144	-41	0	0	-7,119	-168	-6	0	-1,690	8,798
Warm Springs	1980	-272	-7	-24	-66	0	0	0	-6,080	-146	-168	0	-439	3,109
Warm Springs	1990	-273	-5	-24	-103	0	0	0	-6,842	-163	-131	0	-401	7,528
Warm Springs	2000	-516	-5	-12	-144	0	0	0	-7,119	-168	-6	0	-1,690	3,797
White	1980	-175	-10	-47	-937	0	0	0	-6,080	-146	-168	0	-439	1,451
White	1990	-176	-10	-47	-392	0	0	0	-6,842	-163	-131	0	-401	3,708
White	2000	-113	-10	-40	-144	0	0	0	-7,119	-168	-6	0	-1,690	4,573
Whitesburg	1980	-185	-12	-37	-96	0	0	0	-6,080	-146	-168	0	-439	2,128
Whitesburg	1990	-186	-9	-37	-126	0	0	0	-6,842	-163	-131	0	-401	3,994
Whitesburg	2000	-251	-6	-28	-144	0	0	0	-7,119	-168	-6	0	-1,690	4,578
Williamson	1980	-104	-5	-29	-96	0	0	0	-6,080	-146	-168	0	-439	3,711
Williamson	1990	-105	-4	-29	-138	0	0	0	-6,842	-163	-131	0	-401	7,529
Williamson	2000	-232	-4	-18	-144	0	0	0	-7,119	-168	-6	0	-1,690	5,483

Continued on next page

Table 62 (continued)

Place	Year	N	O	P	Q	R	S	T	U	V	W	X	Y	GPI
Winder	1980	-1,645	-240	-65	-134	0	0	0	-6,080	-146	-168	0	-439	1,714
Winder	1990	-1,646	-234	-65	-159	-64	0	0	-6,842	-163	-131	0	-401	4,834
Winder	2000	-506	-266	-61	-144	-47	0	0	-7,119	-168	-6	0	-1,690	4,577
Woodbury	1980	-329	-27	-24	-66	0	0	0	-6,080	-146	-168	0	-439	1,352
Woodbury	1990	-330	-19	-24	-103	0	0	0	-6,842	-163	-131	0	-401	3,649
Woodbury	2000	-249	-13	-12	-144	0	0	0	-7,119	-168	-6	0	-1,690	2,589
Woodstock	1980	-1,299	-37	-47	-289	-97	0	0	-6,080	-146	-168	0	-439	3,040
Woodstock	1990	-1,301	-56	-47	-275	-60	0	0	-6,842	-163	-131	0	-401	8,095
Woodstock	2000	-234	-99	-40	-144	-48	0	0	-7,119	-168	-6	0	-1,690	11,982
Woolsey	1980	-110	-3	-31	-692	0	0	0	-6,080	-146	-168	0	-439	3,829
Woolsey	1990	-111	-4	-31	-270	0	0	0	-6,842	-163	-131	0	-401	6,581
Woolsey	2000	-115	-3	-21	-144	0	0	0	-7,119	-168	-6	0	-1,690	10,983
Zebulon	1980	-151	-17	-29	-96	0	0	0	-6,080	-146	-168	0	-439	4,216
Zebulon	1990	-152	-16	-29	-138	0	0	0	-6,842	-163	-131	0	-401	6,791
Zebulon	2000	-387	-15	-18	-144	0	0	0	-7,119	-168	-6	0	-1,690	3,893

Column headings refer to GPI alphabetical organization, see Section 5.2

B.3 HDI Detailed Data, Counties

Table 63: HDI Values and Indices by County

		textbfProse	**Life**	**Adj.**	**Indexed Values**			
Place	**Year**	**Literacy**[1]	**Expectancy**[2]	**Income**[3]	**Literacy**	**Expectancy**	**Income**	**HDI**
Barrow County	1980	77.19	72.50	6245.08	0.46	0.46	0.21	0.38
Barrow County	1990	77.19	74.21	11921.46	0.46	0.41	0.29	0.39
Barrow County	2000	86.03	75.31	15023.60	0.56	0.36	0.29	0.40
Bartow County	1980	78.00	72.09	6410.95	0.49	0.38	0.24	0.37
Bartow County	1990	78.00	73.83	12391.80	0.49	0.36	0.33	0.39
Bartow County	2000	86.58	74.10	16320.66	0.60	0.14	0.39	0.38
Butts County	1980	71.79	72.98	6005.98	0.28	0.55	0.17	0.33
Butts County	1990	71.79	73.41	9873.04	0.28	0.30	0.10	0.23
Butts County	2000	82.46	73.30	13639.75	0.29	0.00	0.19	0.16
Carroll County	1980	77.73	72.49	6257.01	0.48	0.45	0.22	0.38
Carroll County	1990	77.73	74.31	11382.71	0.48	0.43	0.24	0.38
Carroll County	2000	78.69	74.30	12687.42	0.00	0.18	0.11	0.10
Cherokee County	1980	88.66	74.38	7684.84	0.84	0.82	0.48	0.71
Cherokee County	1990	88.66	76.47	15232.46	0.84	0.73	0.60	0.72
Cherokee County	2000	90.67	76.70	20769.41	0.92	0.60	0.74	0.75
Clayton County	1980	80.76	73.54	8705.68	0.58	0.66	0.67	0.63
Clayton County	1990	80.76	74.55	15038.93	0.58	0.46	0.58	0.54
Clayton County	2000	78.81	74.77	14040.78	0.01	0.26	0.22	0.16
Cobb County	1980	92.66	74.31	10179.45	0.98	0.80	0.94	0.91
Cobb County	1990	92.66	76.50	19112.14	0.98	0.73	0.96	0.89
Cobb County	2000	88.00	77.37	22774.55	0.71	0.72	0.89	0.78
Coweta County	1980	83.75	71.44	6676.76	0.68	0.25	0.29	0.41
Coweta County	1990	83.75	73.61	13303.06	0.68	0.33	0.42	0.48
Coweta County	2000	88.17	75.82	17286.86	0.73	0.45	0.47	0.55
Dawson County	1980	79.99	73.19	5939.19	0.55	0.59	0.16	0.43
Dawson County	1990	79.99	73.38	12310.14	0.55	0.30	0.33	0.39

Continued on next page

Table 63 (continued)

Place	Year	textbfProse Literacy[1]	Life Expectancy[2]	Adj. Income[3]	Indexed Values Literacy	Expectancy	Income	HDI
Dawson County	2000	90.42	76.44	16394.87	0.90	0.56	0.40	0.62
DeKalb County	1980	87.56	71.30	9198.05	0.81	0.23	0.76	0.60
DeKalb County	1990	87.56	71.43	17370.22	0.81	0.02	0.80	0.54
DeKalb County	2000	80.27	73.61	19399.07	0.12	0.06	0.63	0.27
Douglas County	1980	86.10	73.84	8123.56	0.76	0.71	0.56	0.68
Douglas County	1990	86.10	74.61	14590.50	0.76	0.47	0.54	0.59
Douglas County	2000	87.82	75.66	17143.89	0.70	0.42	0.46	0.53
Fayette County	1980	92.69	74.87	10504.08	0.98	0.91	1.00	0.96
Fayette County	1990	92.69	78.42	19567.97	0.98	1.00	1.00	0.99
Fayette County	2000	91.53	78.94	24166.55	0.98	1.00	1.00	0.99
Forsyth County	1980	85.07	73.99	7480.95	0.72	0.74	0.44	0.64
Forsyth County	1990	85.07	75.27	15641.15	0.72	0.56	0.64	0.64
Forsyth County	2000	91.75	77.51	22794.62	1.00	0.75	0.89	0.88
Fulton County	1980	82.04	70.39	8081.99	0.62	0.05	0.55	0.41
Fulton County	1990	82.04	71.25	16971.01	0.62	0.00	0.76	0.46
Fulton County	2000	86.67	74.13	22771.89	0.61	0.15	0.89	0.55
Gwinnett County	1980	93.33	75.33	10072.16	1.00	1.00	0.92	0.97
Gwinnett County	1990	93.33	76.89	18965.73	1.00	0.79	0.94	0.91
Gwinnett County	2000	81.41	78.31	21047.74	0.21	0.89	0.76	0.62
Haralson County	1980	76.28	73.75	6256.28	0.43	0.70	0.22	0.45
Haralson County	1990	76.28	74.09	11143.03	0.43	0.40	0.22	0.35
Haralson County	2000	84.48	73.29	12214.70	0.44	0.00	0.08	0.17
Heard County	1980	68.27	72.49	5426.65	0.16	0.45	0.06	0.23
Heard County	1990	68.27	74.31	9243.37	0.16	0.43	0.04	0.21
Heard County	2000	82.97	74.30	11209.99	0.33	0.18	0.00	0.17
Henry County	1980	86.71	74.00	8238.69	0.78	0.74	0.58	0.70
Henry County	1990	86.71	75.06	15073.91	0.78	0.53	0.58	0.63
Henry County	2000	88.75	75.95	18441.31	0.77	0.47	0.56	0.60

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Table 63 (continued)

Place	Year	textbfProse Literacy[1]	Life Expectancy[2]	Adj. Income[3]	Indexed Values Literacy	Expectancy	Income	HDI
Jasper County	1980	77.62	71.47	6042.19	0.48	0.26	0.18	0.30
Jasper County	1990	77.62	73.54	10983.94	0.48	0.32	0.20	0.33
Jasper County	2000	83.03	74.62	12239.16	0.33	0.24	0.08	0.22
Lamar County	1980	71.81	72.21	6156.95	0.28	0.40	0.20	0.29
Lamar County	1990	71.81	73.56	10193.74	0.28	0.32	0.13	0.24
Lamar County	2000	83.56	74.66	12562.00	0.37	0.24	0.10	0.24
Meriwether County	1980	63.40	70.12	5088.54	0.00	0.00	0.00	0.00
Meriwether County	1990	63.40	72.04	8809.24	0.00	0.11	0.00	0.04
Meriwether County	2000	79.86	73.44	11490.55	0.09	0.03	0.02	0.05
Newton County	1980	76.08	72.91	6803.46	0.42	0.54	0.32	0.43
Newton County	1990	76.08	73.30	11823.32	0.42	0.29	0.28	0.33
Newton County	2000	86.19	74.90	15007.99	0.57	0.28	0.29	0.38
Paulding County	1980	82.91	74.22	6343.25	0.65	0.79	0.23	0.56
Paulding County	1990	82.91	75.64	12809.90	0.65	0.61	0.37	0.55
Paulding County	2000	88.60	75.89	16586.68	0.76	0.46	0.41	0.54
Pickens County	1980	77.33	73.19	5935.79	0.47	0.59	0.16	0.40
Pickens County	1990	77.33	73.38	12420.22	0.47	0.30	0.34	0.37
Pickens County	2000	87.74	76.44	16574.24	0.69	0.56	0.41	0.55
Pike County	1980	80.41	72.21	6335.05	0.57	0.40	0.23	0.40
Pike County	1990	80.41	73.56	11525.99	0.57	0.32	0.25	0.38
Pike County	2000	86.30	74.66	14217.79	0.58	0.24	0.23	0.35
Rockdale County	1980	88.88	74.58	8910.13	0.85	0.86	0.71	0.80
Rockdale County	1990	88.88	75.29	15687.84	0.85	0.56	0.64	0.68
Rockdale County	2000	87.23	76.35	17725.67	0.65	0.54	0.50	0.57
Spalding County	1980	74.30	71.55	6457.91	0.36	0.27	0.25	0.30
Spalding County	1990	74.30	73.02	11527.80	0.36	0.25	0.25	0.29
Spalding County	2000	82.08	73.49	13570.91	0.26	0.04	0.18	0.16
Walton County	1980	75.15	72.15	6037.04	0.39	0.39	0.18	0.32

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Table 63 (continued)

Place	Year	textbfProse Literacy[1]	Life Expectancy[2]	Adj. Income[3]	Indexed Values Literacy	Expectancy	Income	HDI
Walton County	1990	75.15	74.28	11550.93	0.39	0.42	0.25	0.36
Walton County	2000	86.61	75.91	14791.29	0.61	0.46	0.28	0.45

1. Literacy is adult prose literacy
2. Life expectancy at birth in the given year
3. Adjusted income is inequality adjusted per capita income

APPENDIX C

PLAN CODING DETAILED DATA

C.1 Plan coding results summary

Table 64: Plan Evaluation Summary, by Jurisdiction and Dimension

	Social		Economics		Environment		Resources	
Place	Score	SDP	Score	SDP	Score	SDP	Score	SDP
Acworth	2.465	0.243	1.955	0.364	1.865	0.452	1.815	0.516
Auburn	2.195	0.186	2	0.273	1.47	0.485	1.519	0.475
Ball Ground	2	0.425	1.5	0.25	0.889	0.333	1	0.375
Barrow	2.195	0.186	2	0.273	1.47	0.485	1.519	0.475
Bethlehem	2.195	0.186	2	0.273	1.47	0.485	1.519	0.475
Braswell	2.948	0.375	2.5	0.667	2.3	0.667	2.562	0.511
Butts	1.764	0.307	1.5	0.833	1.533	0.233	1.914	0.336
Carl	2.195	0.186	2	0.273	1.47	0.485	1.519	0.475
Carroll	3.103	0.331	2.321	0.393	2.274	0.533	2.257	0.57
Centralhatchee	2.25	0.229	1.5	0	1.611	0.278	1.896	0.25
Cherokee	1.805	0.334	1.714	0.214	1.389	0.361	1.449	0.391
Clayton	3.126	0.436	2.639	0.444	2.04	0.558	2.279	0.439
Cobb	2.115	0.191	1.25	0	1.574	0.519	1.65	0.375
Concord	2.174	0.225	2.8	0.2	1.958	0.167	2.052	0.161
Coweta	1.523	0.358	2	0.25	1.401	0.556	1.275	0.417
Dallas	2.948	0.375	2.5	0.667	2.3	0.667	2.562	0.511
Dawson	2.486	0.208	1.6	0.2	1.833	0.5	1.767	0.417
Decatur	2.427	0.146	1.75	0.25	2.333	0.333	1.948	0.51
Douglas	2.65	0.555	2.5	0.5	1.833	0.519	1.972	0.641
Ephesus	2.528	0.153	1.5	0	1.667	0.317	1.875	0.313
Fairburn	1.254	0.338	1.429	0.286	0.889	0.417	0.914	0.622
Fayetteville	1.875	0	0	0	1	0.167	1.083	0.083
Forsyth	2.265	0.893	2.5	0.5	1.917	0.625	2.119	0.528
Franklin	2.469	0.156	1.333	0	2.063	0.635	2.08	0.393
Fulton	1.948	0.609	1.762	0.429	1.889	0.636	1.651	0.654
Gay	2.119	0.536	2.167	0.333	1.667	0.333	1.833	0.5
Good Hope	1.922	0.128	1.778	0.222	2.2	0.667	1.525	0.45
Greenville	2.119	0.536	2.167	0.333	1.667	0.333	1.833	0.5
Gwinnett	2.343	0.162	1	0	1.65	0.583	1.461	0.518
Heard	2.494	0.294	3	0.286	2.116	0.565	2.083	0.489
Hiram	2.948	0.375	2.5	0.667	2.3	0.667	2.562	0.511
Jasper	2.475	0.283	1.929	0.3	1.5	0.3	1.667	0.358

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Table 64 (continued)

Place	Social Score	Social SDP	Economics Score	Economics SDP	Environment Score	Environment SDP	Resources Score	Resources SDP
Lamar	1.847	0.194	1.5	0.5	2.333	0.667	2.236	0.722
Lithonia	2.232	0.285	1.182	0.273	1.917	0.333	1.999	0.406
Loganville	1.922	0.128	1.778	0.222	2.2	0.667	1.525	0.45
Lone Oak	2.119	0.536	2.167	0.333	1.667	0.333	1.833	0.5
Lovejoy	3.35	0.13	3	0	2.014	0.333	2.225	0.464
Luthersville	2.119	0.536	2.167	0.333	1.667	0.333	1.833	0.5
Manchester	2.119	0.536	2.167	0.333	1.667	0.333	1.833	0.5
Marietta	2.043	0.427	1.75	0.25	1.752	0.476	1.52	0.455
Meansville	2.174	0.225	2.8	0.2	1.958	0.167	2.052	0.161
Meriwether	2.119	0.536	2.167	0.333	1.667	0.333	1.833	0.5
Molena	2.174	0.225	2.8	0.2	1.958	0.167	2.052	0.161
Monroe	1.922	0.128	1.778	0.222	2.2	0.667	1.525	0.45
Monticello	2.917	0.375	2	0.6	1.667	0.333	1.75	0.5
Moreland	1.875	0.233	2.333	0.333	0.778	0.333	1.458	0.5
Nelson	2.033	0.192	1.857	0	1.333	0.267	1.583	0.217
Paulding	2.948	0.375	2.5	0.667	2.3	0.667	2.562	0.511
Pickens	2.033	0.192	1.857	0	1.333	0.267	1.583	0.217
Pike	2.174	0.225	2.8	0.2	1.958	0.167	2.052	0.161
Powder Springs	1.531	0.063	1.125	0.25	1.333	0.333	1.74	0.417
Shady Dale	2.75	0	3	0	2	0.333	1.75	0.25
Smyrna	1.335	0.239	2.091	0.091	1.519	0.5	1.553	0.381
Social Circle	1.922	0.128	1.778	0.222	2.2	0.667	1.525	0.45
Statham	2.195	0.186	2	0.273	1.47	0.485	1.519	0.475
Talking Rock	2.033	0.192	1.857	0	1.333	0.267	1.583	0.217
Waleska	1.708	0.583	1.333	0.333	1.333	0.333	1.5	0.5
Walnut Grove	1.922	0.128	1.778	0.222	2.2	0.667	1.525	0.45
Walton	1.922	0.128	1.778	0.222	2.2	0.667	1.525	0.45
Warm Springs	2.119	0.536	2.167	0.333	1.667	0.333	1.833	0.5
Williamson	2.174	0.225	2.8	0.2	1.958	0.167	2.052	0.161
Winder	2.195	0.186	2	0.273	1.47	0.485	1.519	0.475
Woodbury	2.119	0.536	2.167	0.333	1.667	0.333	1.833	0.5
Zebulon	2.174	0.225	2.8	0.2	1.958	0.167	2.052	0.161

SDP - commitment to sustainable development

C.2 *Plan details for Forsyth County*

This section shows the distribution of statements for Forsyth County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 81) show how the policy statements in the Forsyth County comprehensive plan are organized. Quality score distributions (Figure 82) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 83.

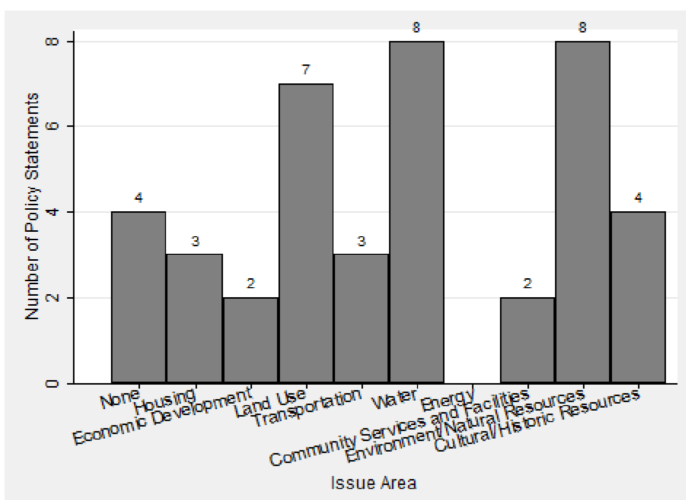

Figure 81: Distribution of Statements by Issue Area, Forsyth County

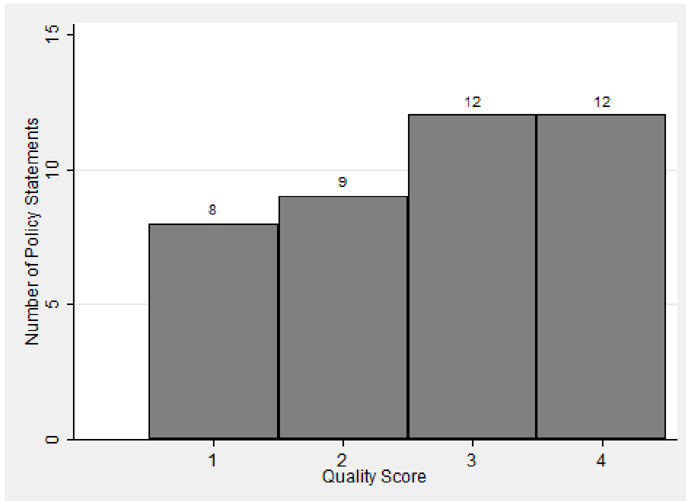

Figure 82: Distribution of Statements by Quality Score, Forsyth County

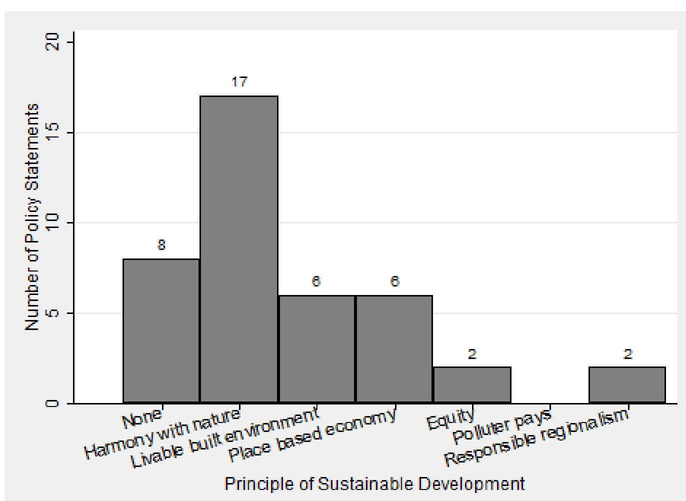

Figure 83: Distribution of Statements by Principle of Sustainable Development, Forsyth County

C.3 Plan details for Fulton County

This section shows the distribution of statements for Fulton County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 84) show how the policy statements in the Fulton County comprehensive plan are organized. Quality score distributions (Figure 85) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 86.

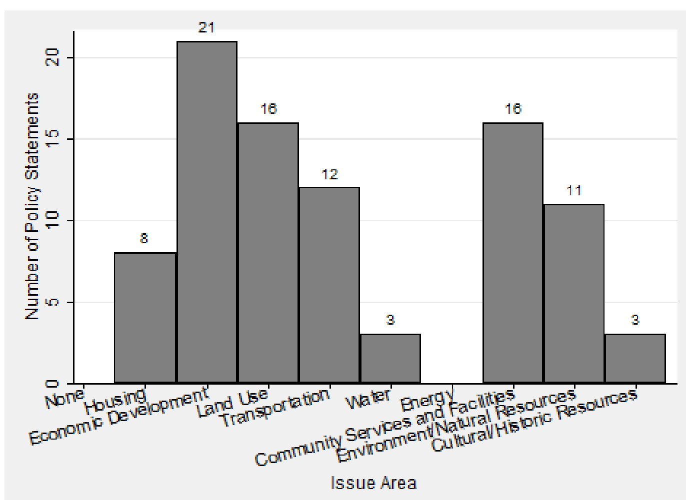

Figure 84: Distribution of Statements by Issue Area, Fulton County

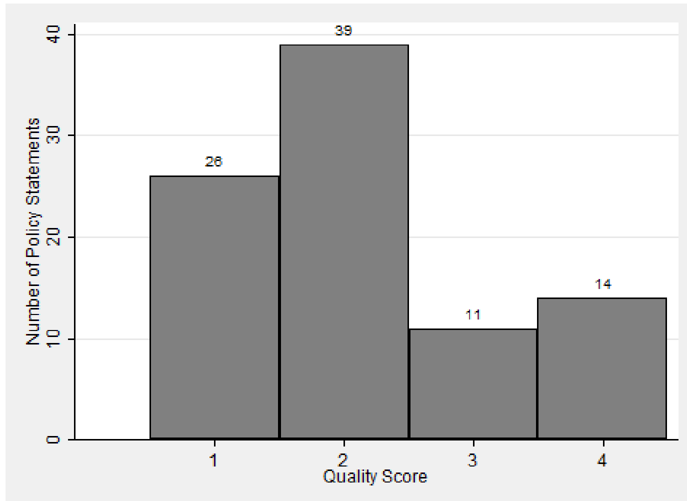

Figure 85: Distribution of Statements by Quality Score, Fulton County

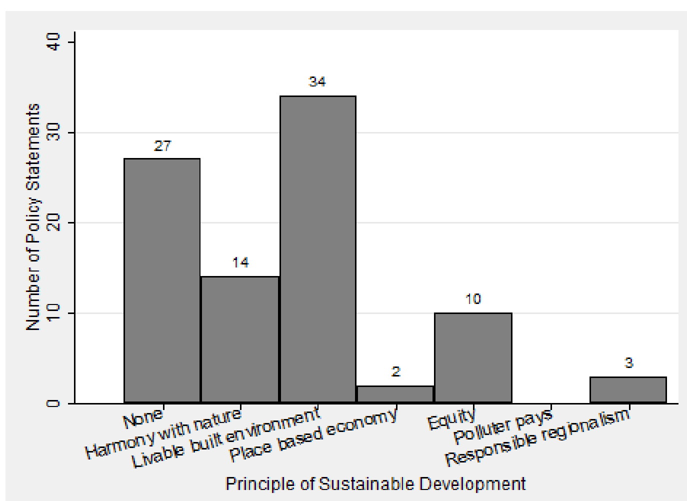

Figure 86: Distribution of Statements by Principle of Sustainable Development, Fulton County

C.4 Plan details for Clayton County

This section shows the distribution of statements for Clayton County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 87) show how the policy statements in the Clayton County comprehensive plan are organized. Quality score distributions (Figure 88) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 89.

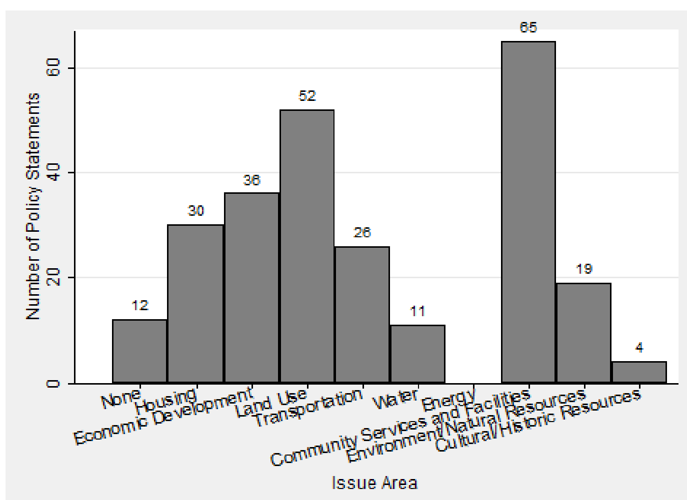

Figure 87: Distribution of Statements by Issue Area, Clayton County

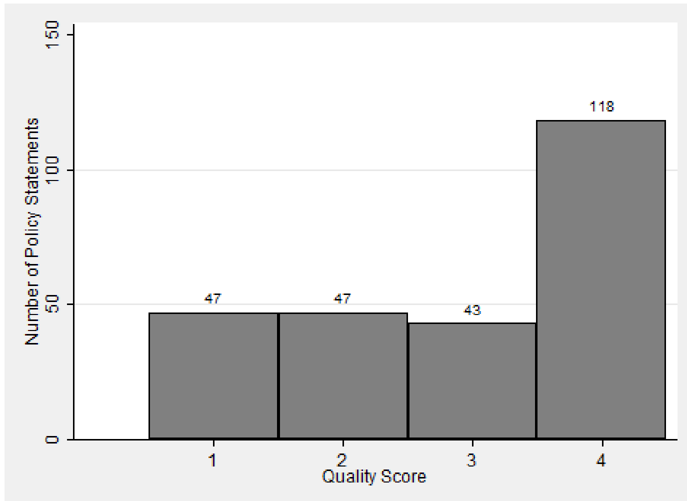

Figure 88: Distribution of Statements by Quality Score, Clayton County

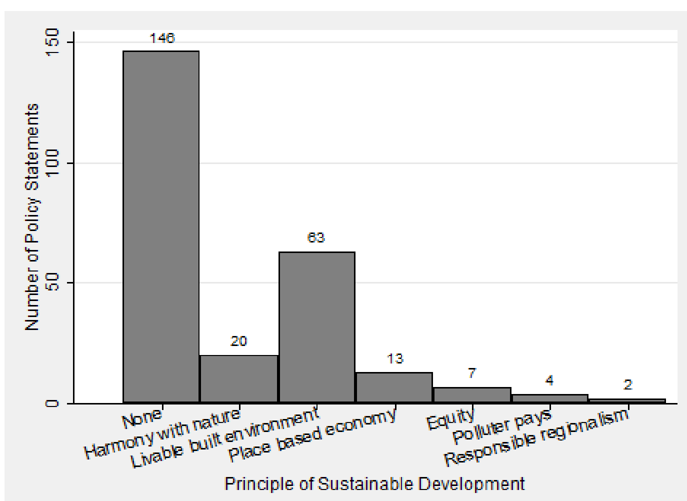

Figure 89: Distribution of Statements by Principle of Sustainable Development, Clayton County

C.5 Plan details for Paulding County

This section shows the distribution of statements for Paulding County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 90) show how the policy statements in the Paulding County comprehensive plan are organized. Quality score distributions (Figure 91) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 92.

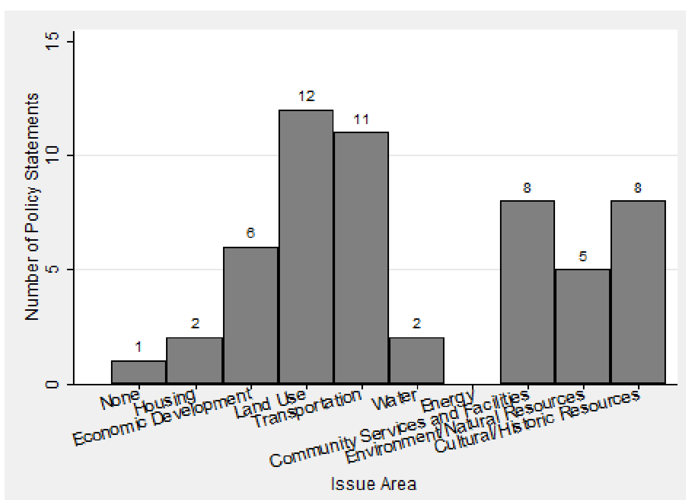

Figure 90: Distribution of Statements by Issue Area, Paulding County

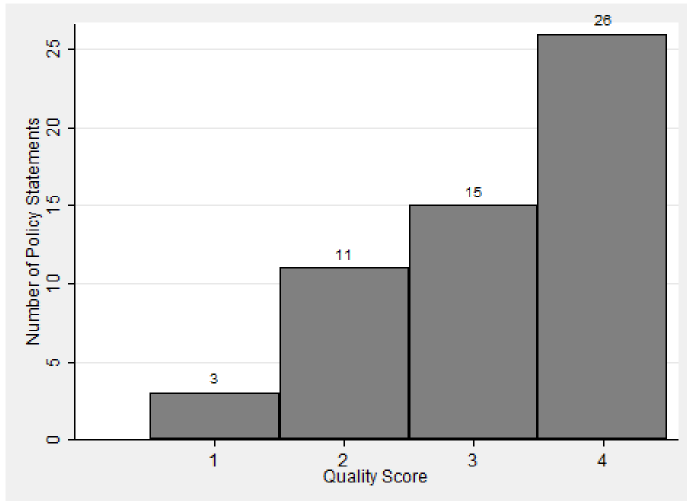

Figure 91: Distribution of Statements by Quality Score, Paulding County

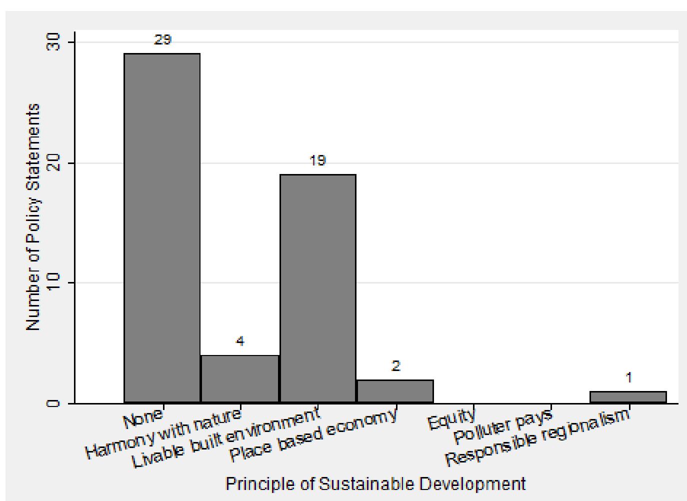

Figure 92: Distribution of Statements by Principle of Sustainable Development, Paulding County

C.6 Plan details for Meriwether County

This section shows the distribution of statements for Meriwether County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 93) show how the policy statements in the Meriwether County comprehensive plan are organized. Quality score distributions (Figure 94) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 95.

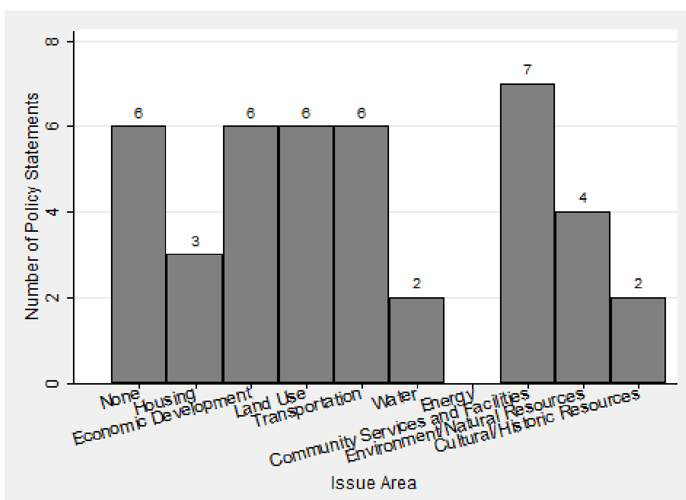

Figure 93: Distribution of Statements by Issue Area, Meriwether County

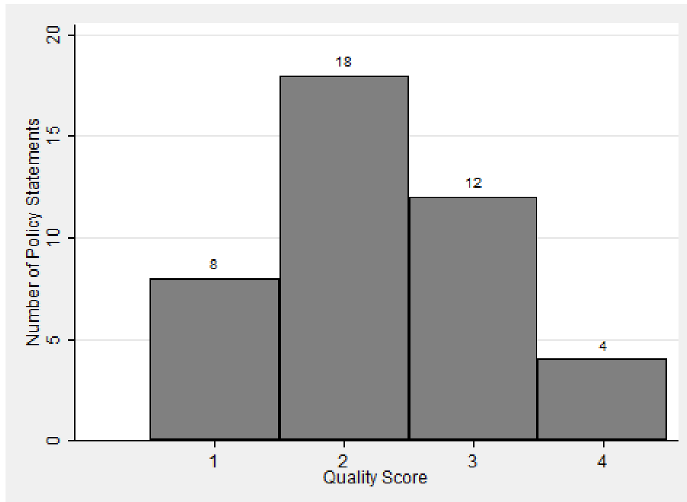

Figure 94: Distribution of Statements by Quality Score, Meriwether County

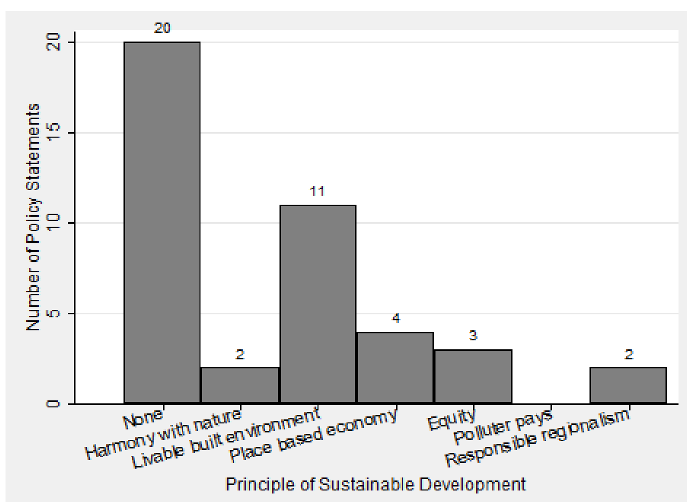

Figure 95: Distribution of Statements by Principle of Sustainable Development, Meriwether County

C.7 Plan details for Douglas County

This section shows the distribution of statements for Douglas County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 96) show how the policy statements in the Douglas County comprehensive plan are organized. Quality score distributions (Figure 97) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 98.

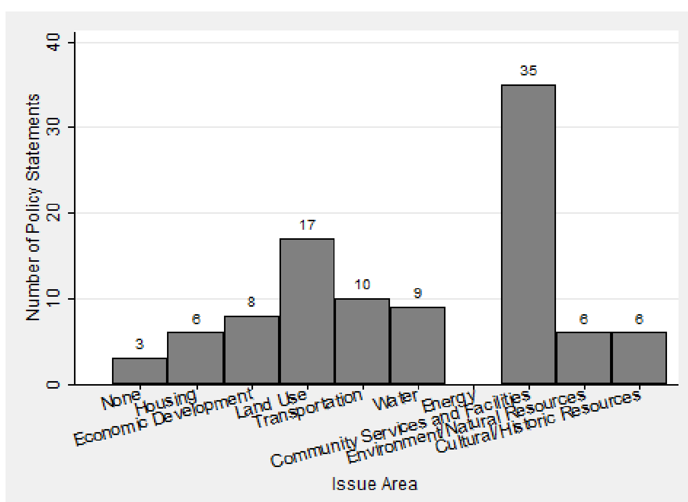

Figure 96: Distribution of Statements by Issue Area, Douglas County

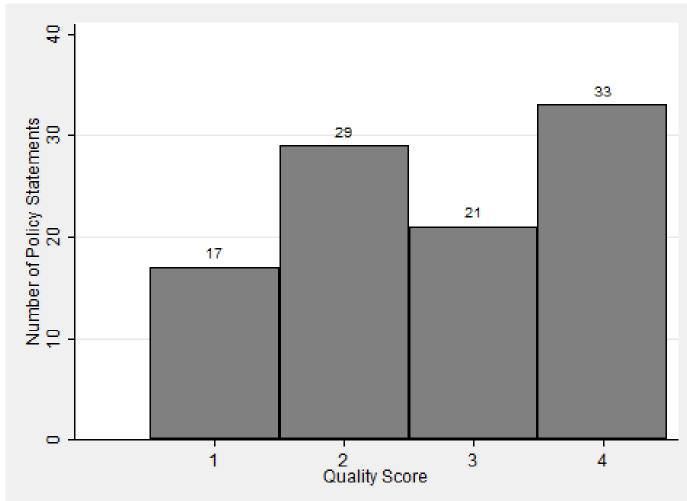

Figure 97: Distribution of Statements by Quality Score, Douglas County

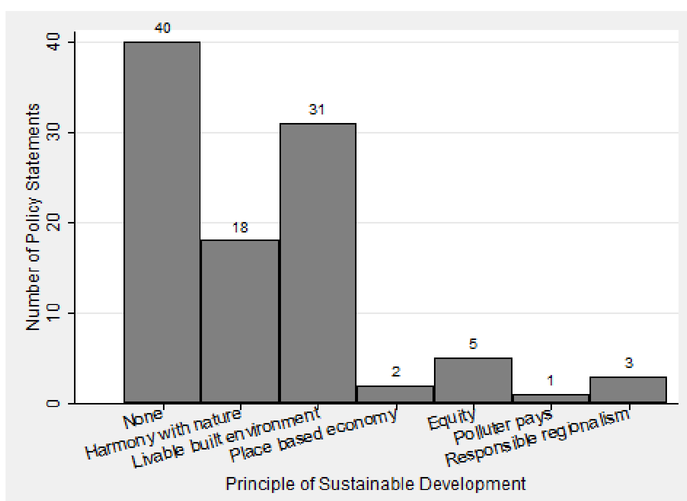

Figure 98: Distribution of Statements by Principle of Sustainable Development, Douglas County

C.8 Plan details for Carroll County

This section shows the distribution of statements for Carroll County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 99) show how the policy statements in the Carroll County comprehensive plan are organized. Quality score distributions (Figure 100) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 101.

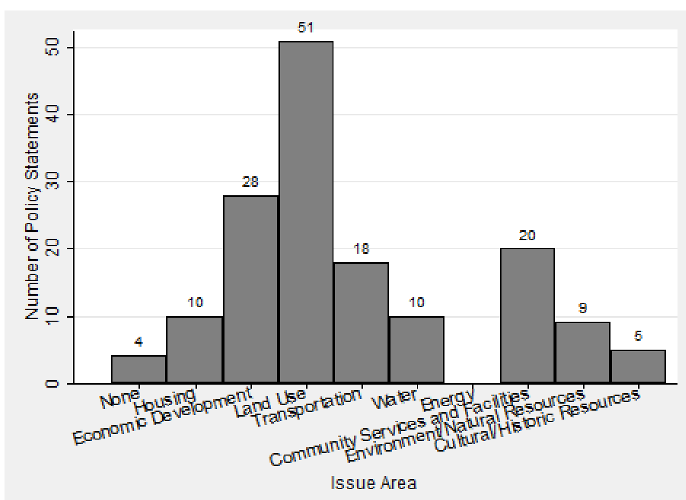

Figure 99: Distribution of Statements by Issue Area, Carroll County

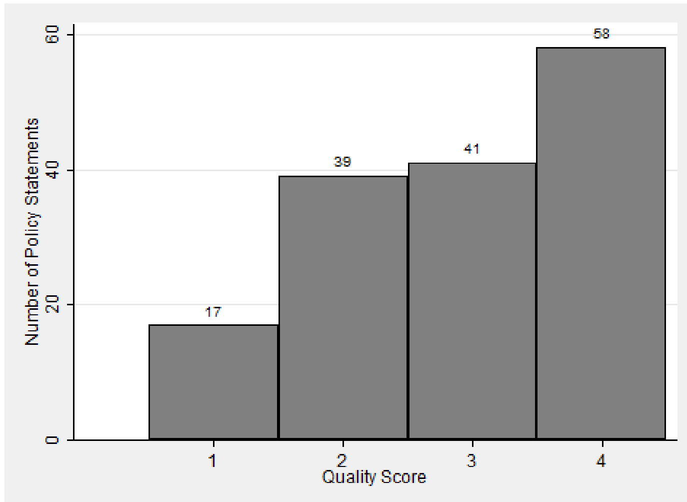

Figure 100: Distribution of Statements by Quality Score, Carroll County

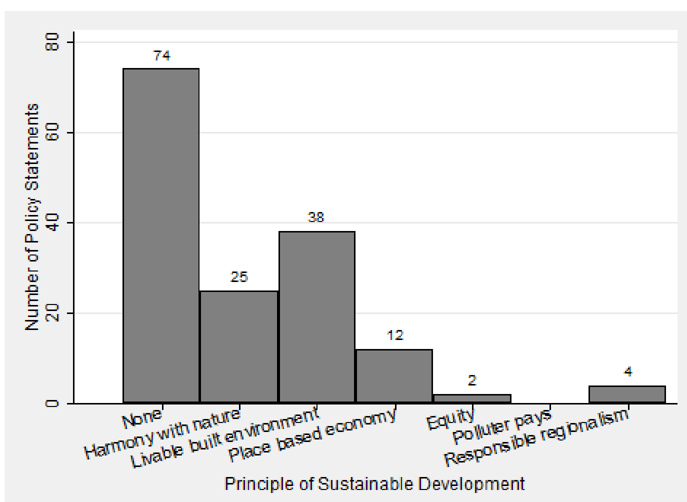

Figure 101: Distribution of Statements by Principle of Sustainable Development, Carroll County

C.9 Plan details for Fairburn

This section shows the distribution of statements for Fairburn by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 102) show how the policy statements in the Fairburn comprehensive plan are organized. Quality score distributions (Figure 103) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 104.

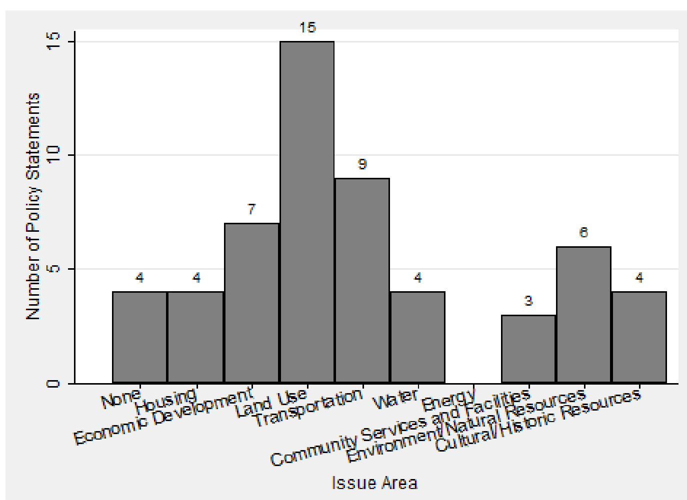

Figure 102: Distribution of Statements by Issue Area, Fairburn

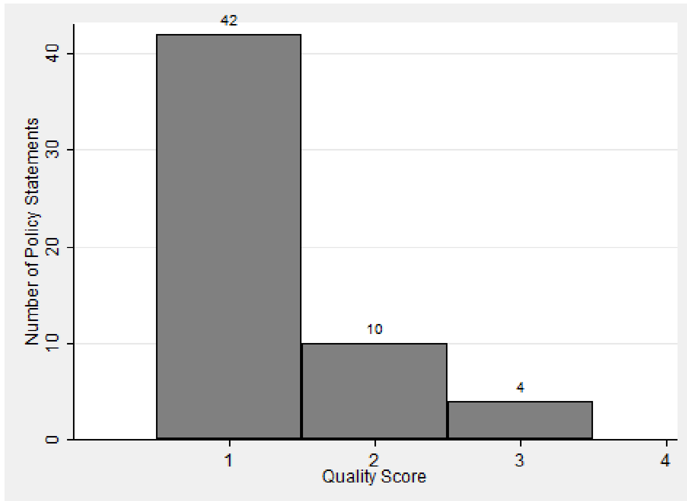

Figure 103: Distribution of Statements by Quality Score, Fairburn

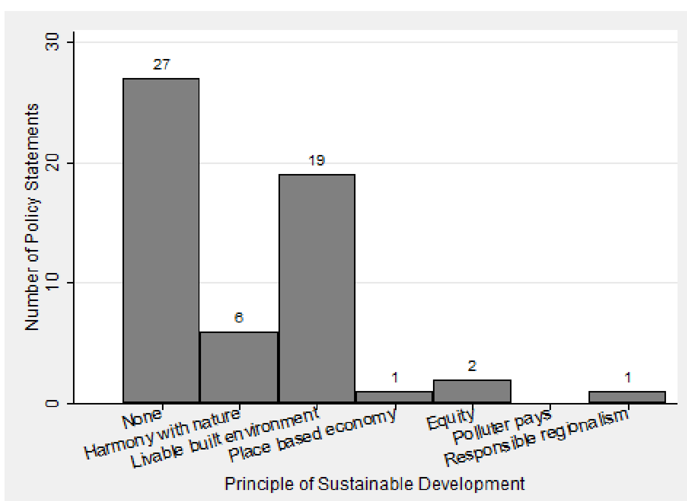

Figure 104: Distribution of Statements by Principle of Sustainable Development, Fairburn

C.10 Plan details for Lamar County

This section shows the distribution of statements for Lamar County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 105) show how the policy statements in the Lamar County comprehensive plan are organized. Quality score distributions (Figure 106) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 107.

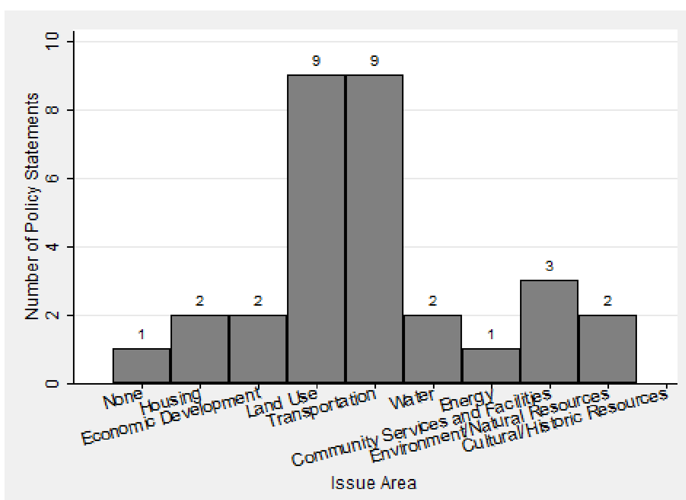

Figure 105: Distribution of Statements by Issue Area, Lamar County

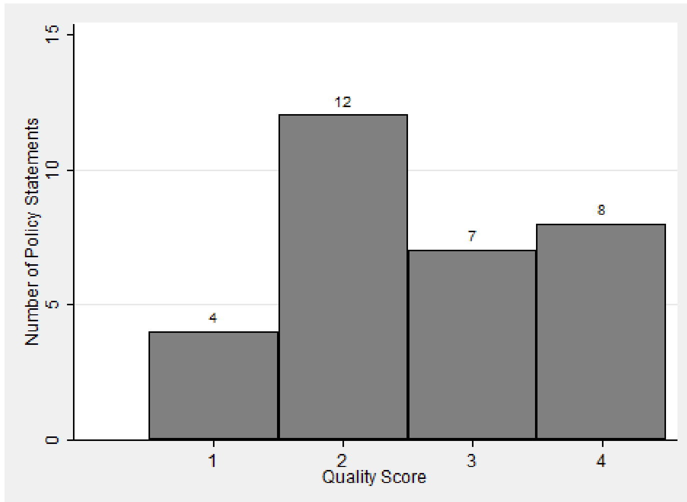

Figure 106: Distribution of Statements by Quality Score, Lamar County

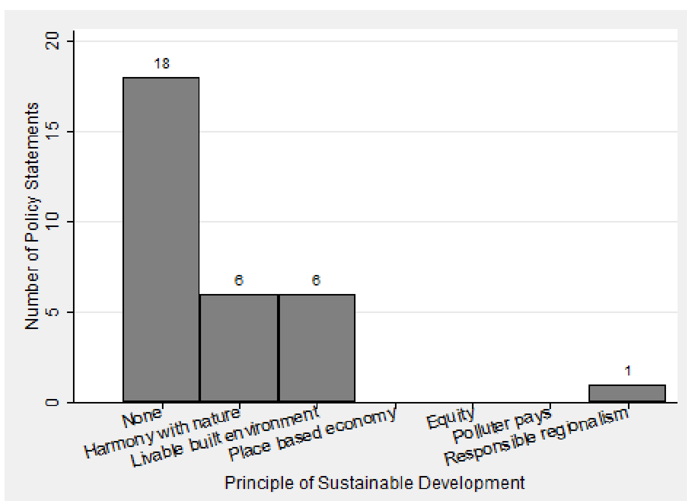

Figure 107: Distribution of Statements by Principle of Sustainable Development, Lamar County

C.11 Plan details for Lithonia

This section shows the distribution of statements for Lithonia by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 108) show how the policy statements in the Lithonia comprehensive plan are organized. Quality score distributions (Figure 109) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 110.

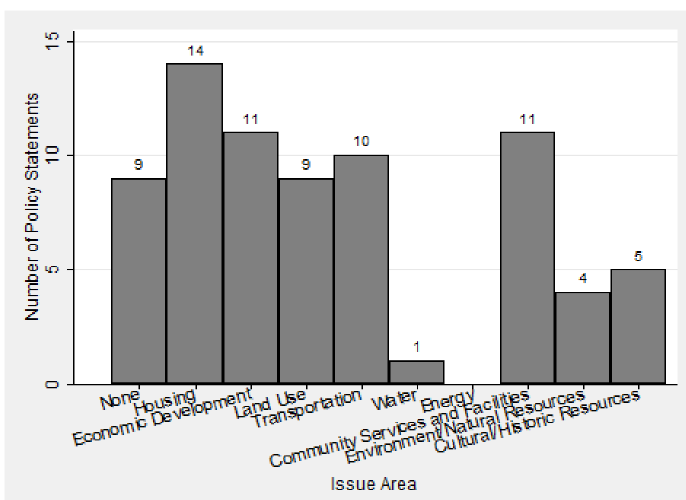

Figure 108: Distribution of Statements by Issue Area, Lithonia

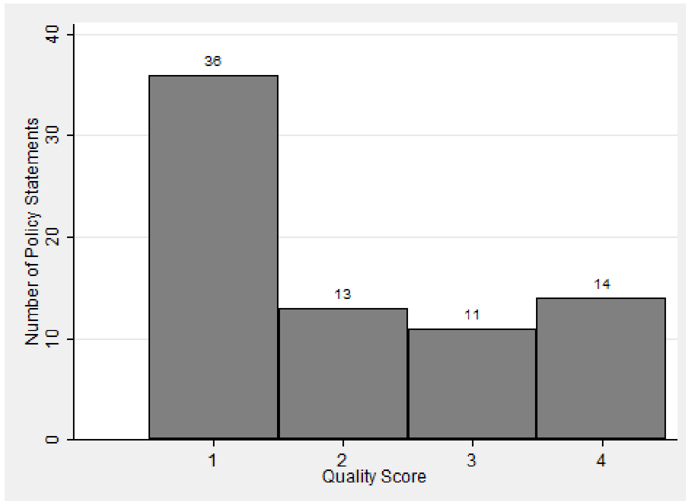

Figure 109: Distribution of Statements by Quality Score, Lithonia

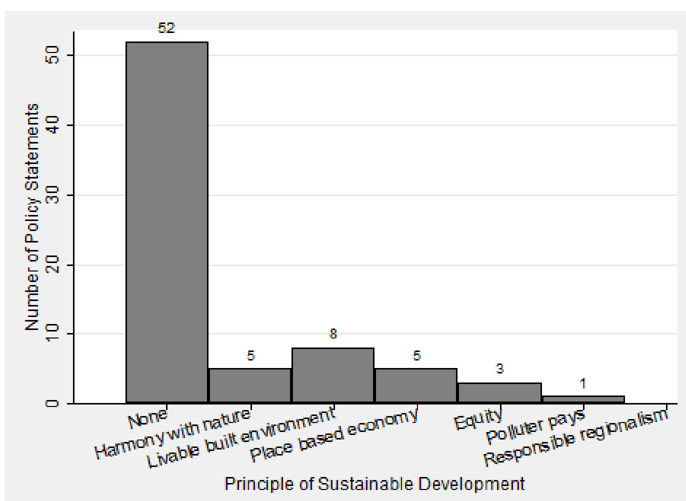

Figure 110: Distribution of Statements by Principle of Sustainable Development, Lithonia

C.12 Plan details for Decatur

This section shows the distribution of statements for Decatur by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 111) show how the policy statements in the Decatur comprehensive plan are organized. Quality score distributions (Figure 112) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 113.

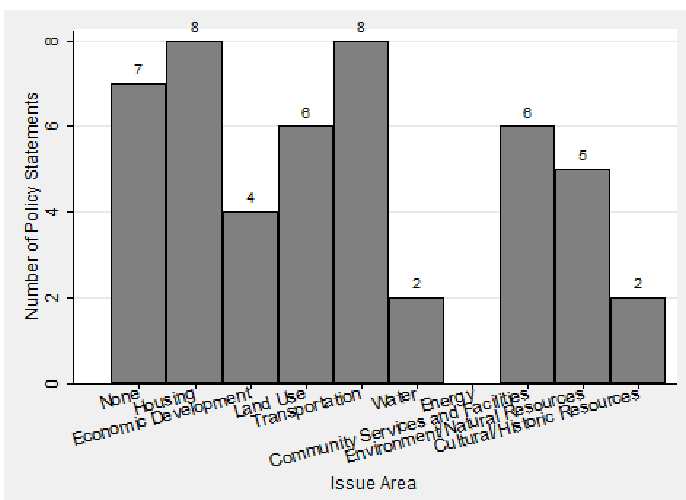

Figure 111: Distribution of Statements by Issue Area, Decatur

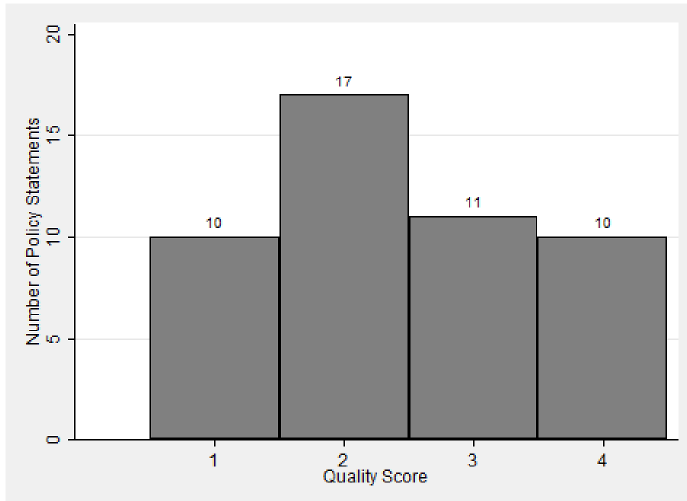

Figure 112: Distribution of Statements by Quality Score, Decatur

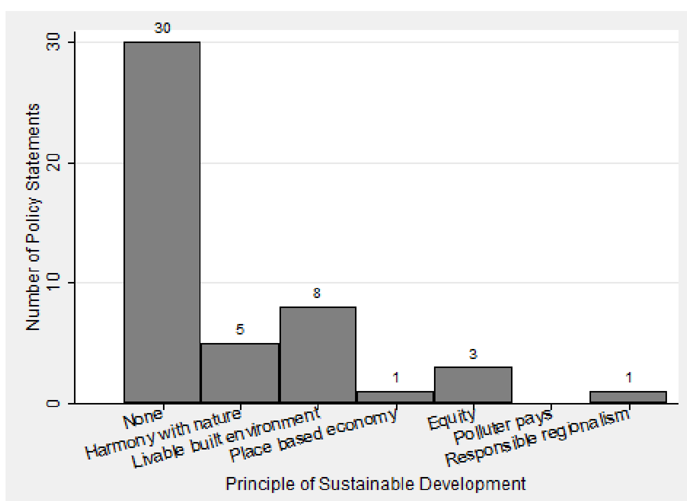

Figure 113: Distribution of Statements by Principle of Sustainable Development, Decatur

C.13 Plan details for Jasper County

This section shows the distribution of statements for Jasper County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 114) show how the policy statements in the Jasper County comprehensive plan are organized. Quality score distributions (Figure 115) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 116.

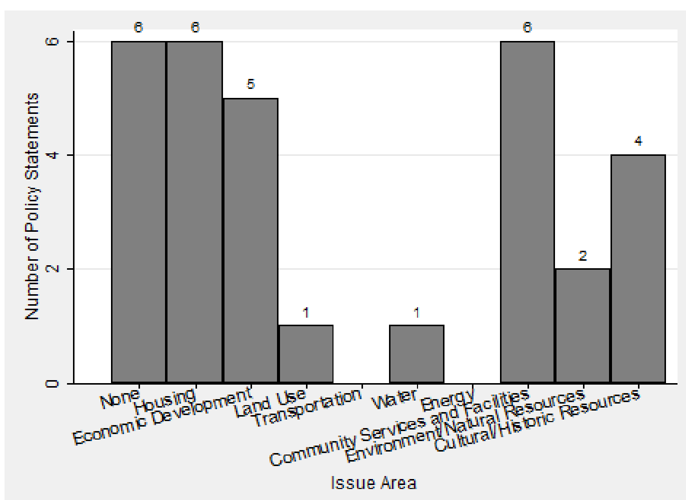

Figure 114: Distribution of Statements by Issue Area, Jasper County

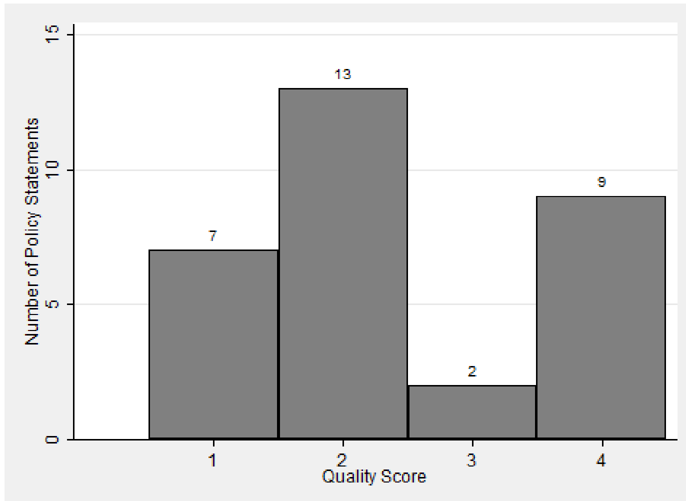

Figure 115: Distribution of Statements by Quality Score, Jasper County

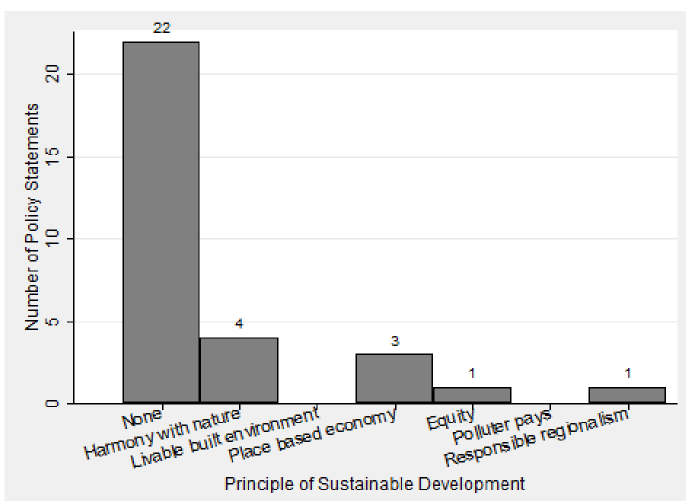

Figure 116: Distribution of Statements by Principle of Sustainable Development, Jasper County

C.14 Plan details for Shady Dale

This section shows the distribution of statements for Shady Dale by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 117) show how the policy statements in the Shady Dale comprehensive plan are organized. Quality score distributions (Figure 118) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 119.

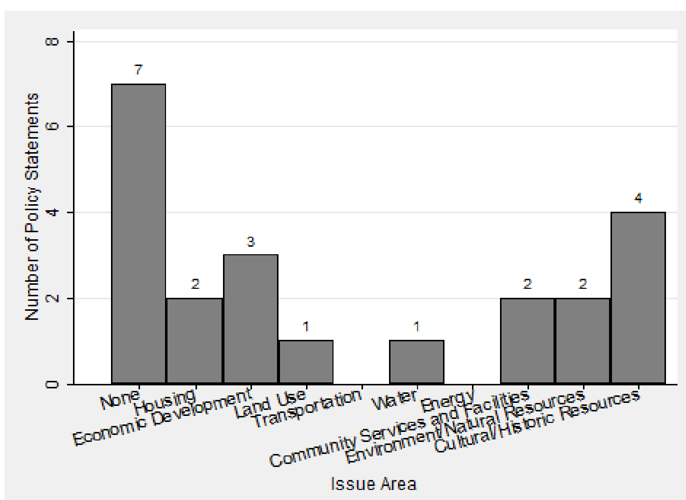

Figure 117: Distribution of Statements by Issue Area, Shady Dale

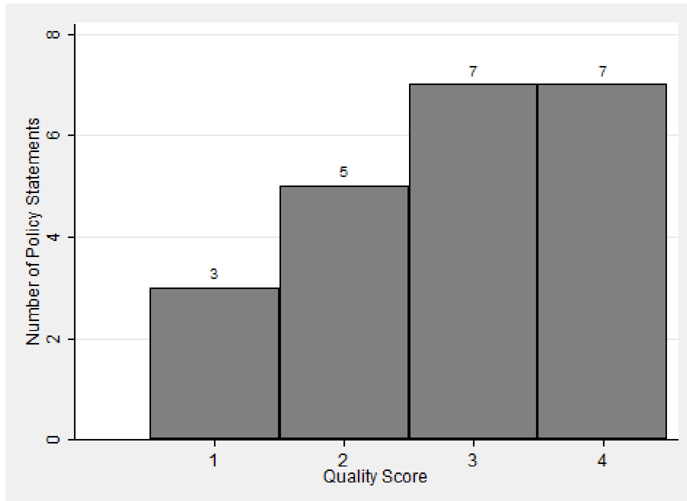

Figure 118: Distribution of Statements by Quality Score, Shady Dale

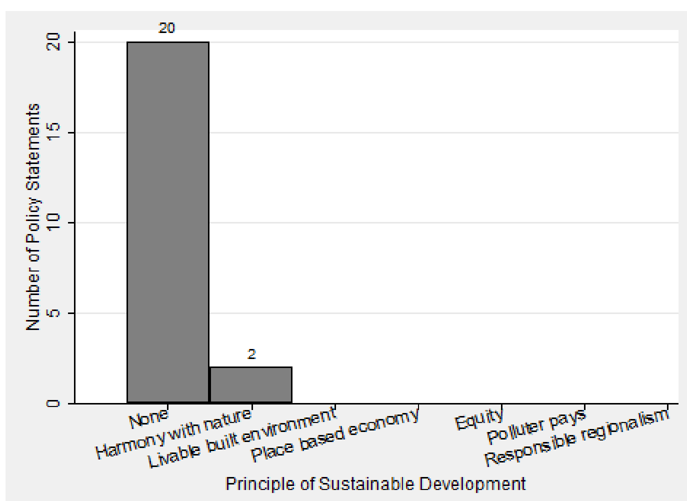

Figure 119: Distribution of Statements by Principle of Sustainable Development, Shady Dale

C.15 Plan details for Moreland

This section shows the distribution of statements for Moreland by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 120) show how the policy statements in the Moreland comprehensive plan are organized. Quality score distributions (Figure 121) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 122.

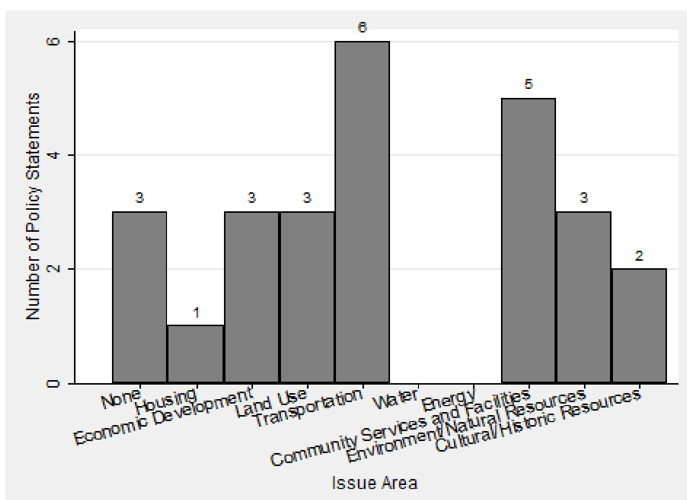

Figure 120: Distribution of Statements by Issue Area, Moreland

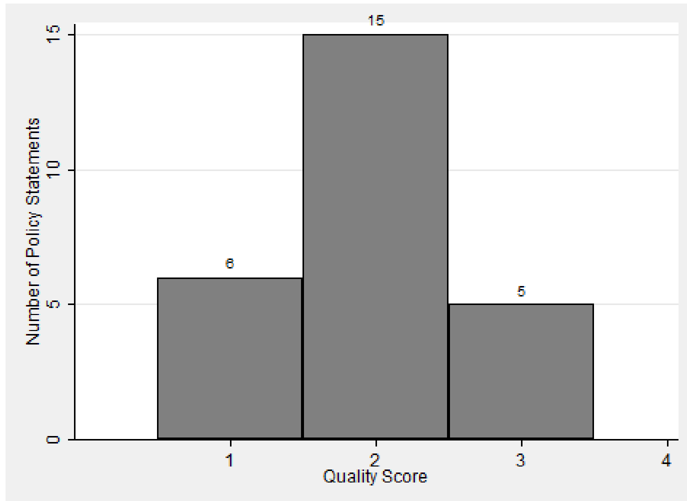

Figure 121: Distribution of Statements by Quality Score, Moreland

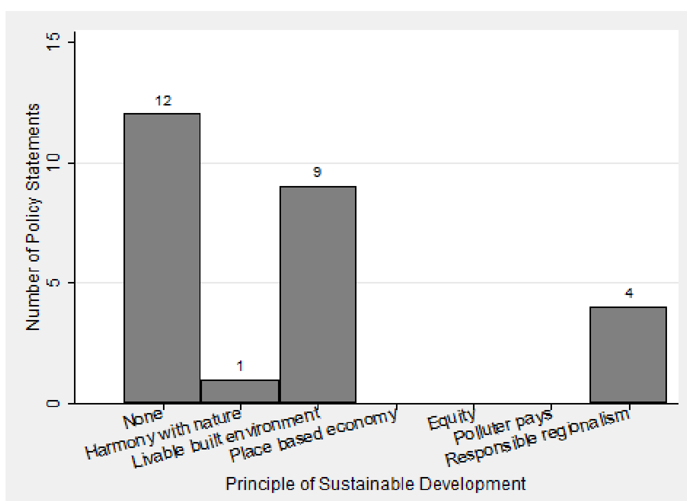

Figure 122: Distribution of Statements by Principle of Sustainable Development, Moreland

C.16 Plan details for Barrow County

This section shows the distribution of statements for Barrow County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 123) show how the policy statements in the Barrow County comprehensive plan are organized. Quality score distributions (Figure 124) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 125.

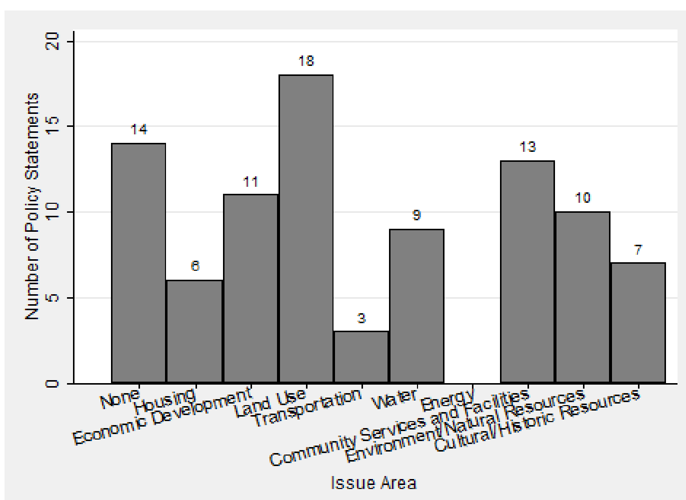

Figure 123: Distribution of Statements by Issue Area, Barrow County

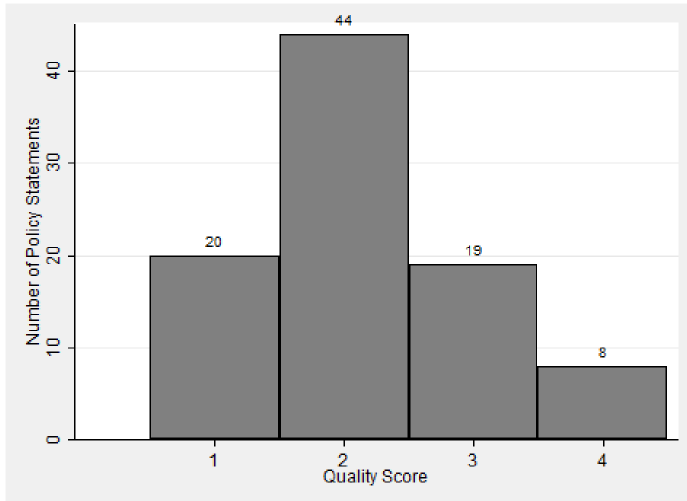

Figure 124: Distribution of Statements by Quality Score, Barrow County

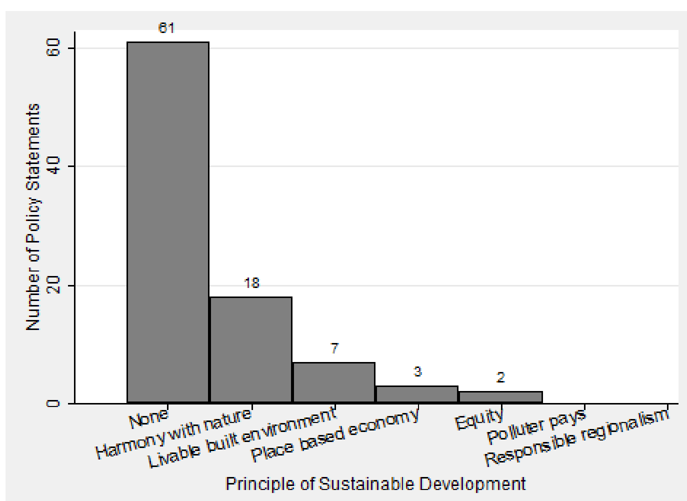

Figure 125: Distribution of Statements by Principle of Sustainable Development, Barrow County

C.17 Plan details for Fayetteville

This section shows the distribution of statements for Fayetteville by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 126) show how the policy statements in the Fayetteville comprehensive plan are organized. Quality score distributions (Figure 127) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 128.

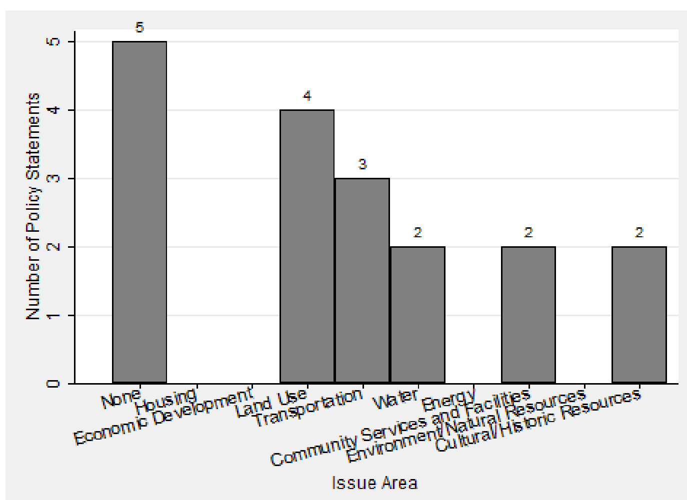

Figure 126: Distribution of Statements by Issue Area, Fayetteville

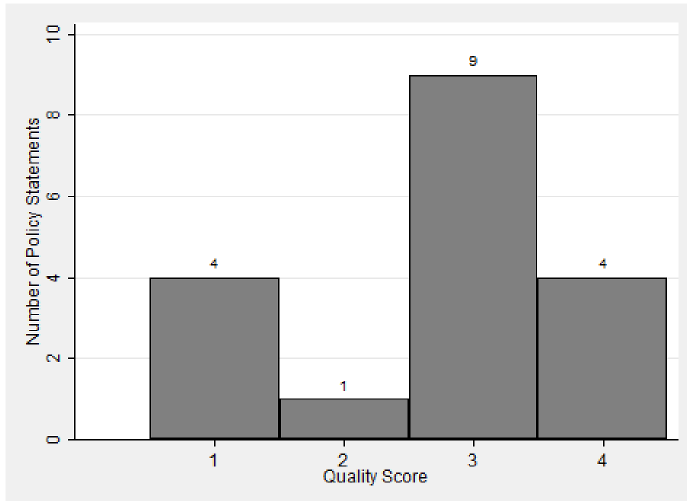

Figure 127: Distribution of Statements by Quality Score, Fayetteville

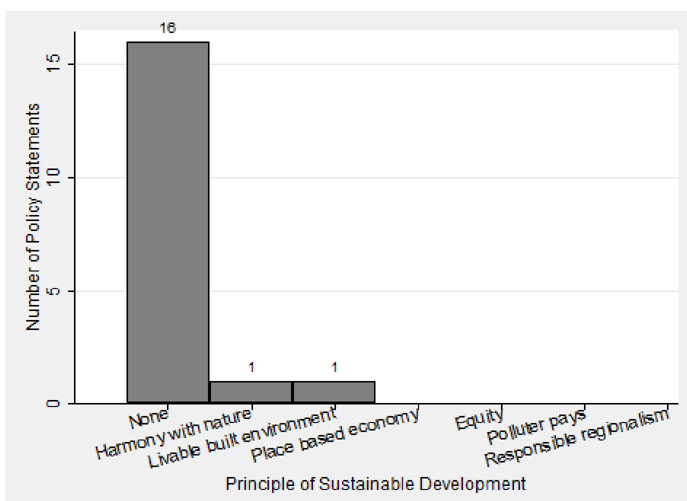

Figure 128: Distribution of Statements by Principle of Sustainable Development, Fayetteville

C.18 Plan details for Powder Springs

This section shows the distribution of statements for Powder Springs by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 129) show how the policy statements in the Powder Springs comprehensive plan are organized. Quality score distributions (Figure 130) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 131.

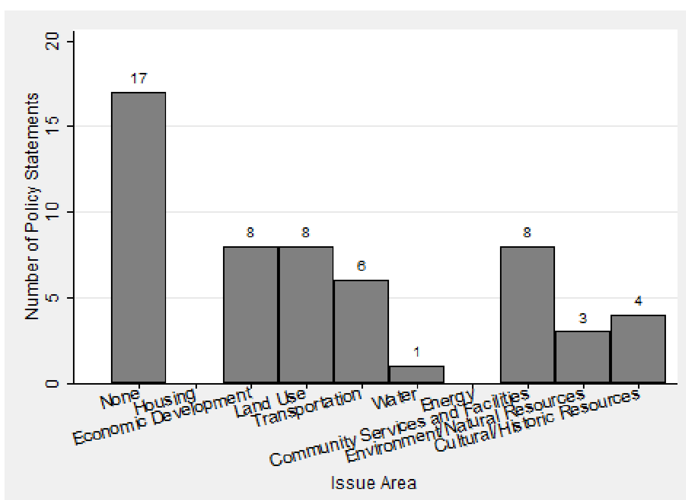

Figure 129: Distribution of Statements by Issue Area, Powder Springs

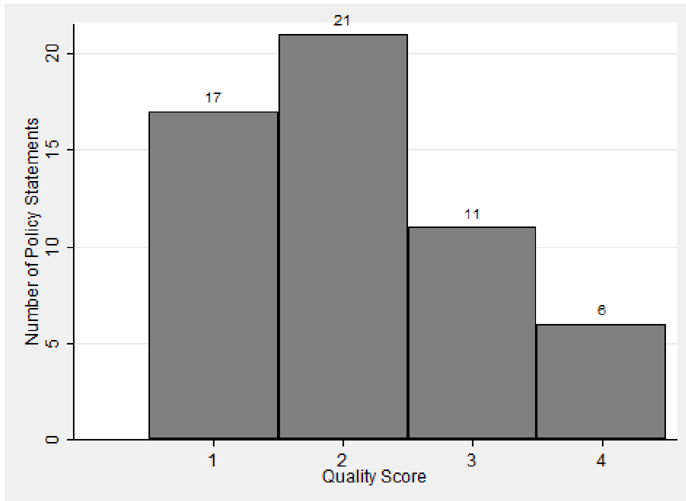

Figure 130: Distribution of Statements by Quality Score, Powder Springs

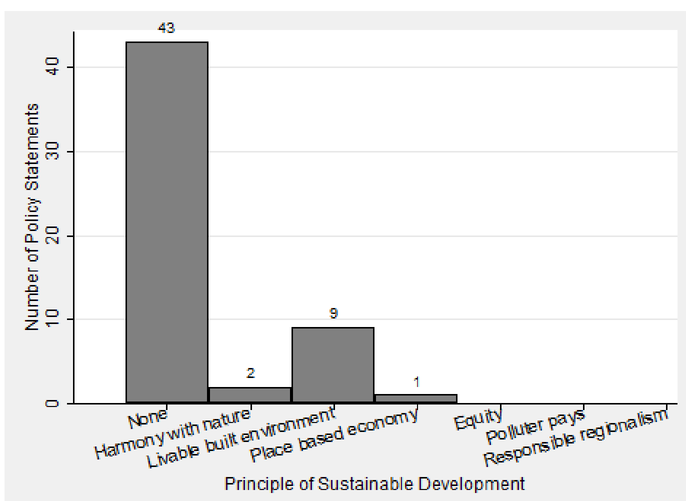

Figure 131: Distribution of Statements by Principle of Sustainable Development, Powder Springs

C.19 Plan details for Marietta

This section shows the distribution of statements for Marietta by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 132) show how the policy statements in the Marietta comprehensive plan are organized. Quality score distributions (Figure 133) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 134.

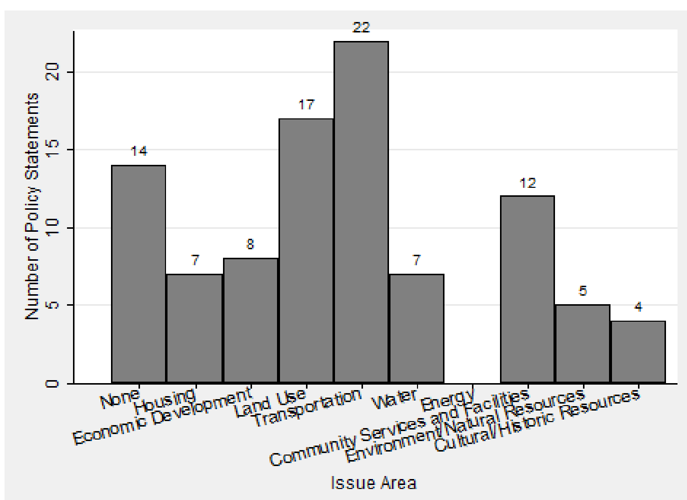

Figure 132: Distribution of Statements by Issue Area, Marietta

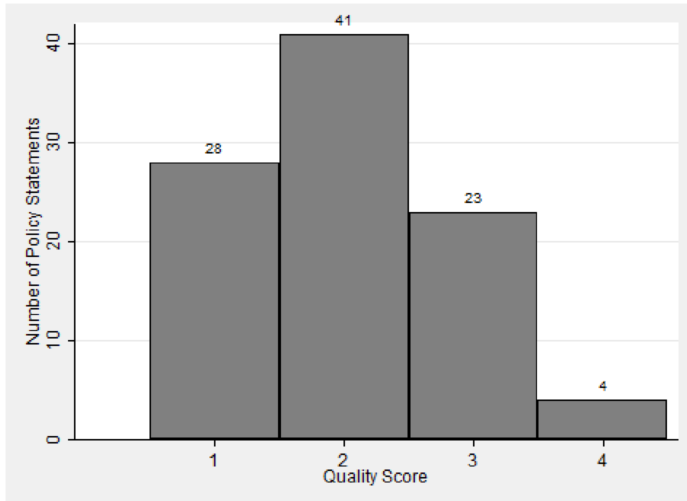

Figure 133: Distribution of Statements by Quality Score, Marietta

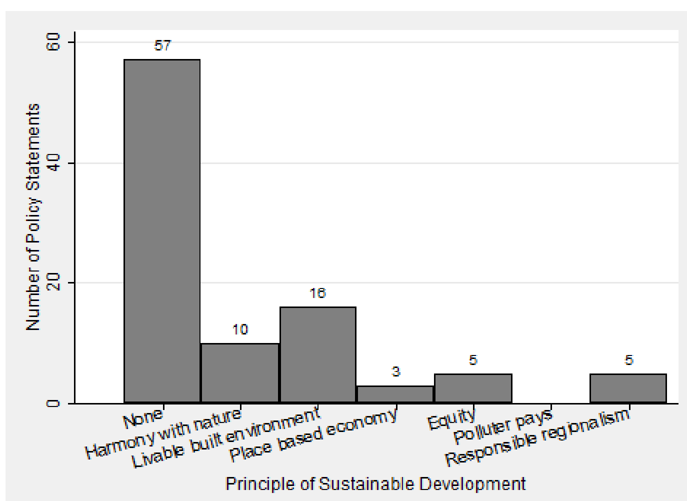

Figure 134: Distribution of Statements by Principle of Sustainable Development, Marietta

C.20 Plan details for Acworth

This section shows the distribution of statements for Acworth by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 135) show how the policy statements in the Acworth comprehensive plan are organized. Quality score distributions (Figure 136) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 137.

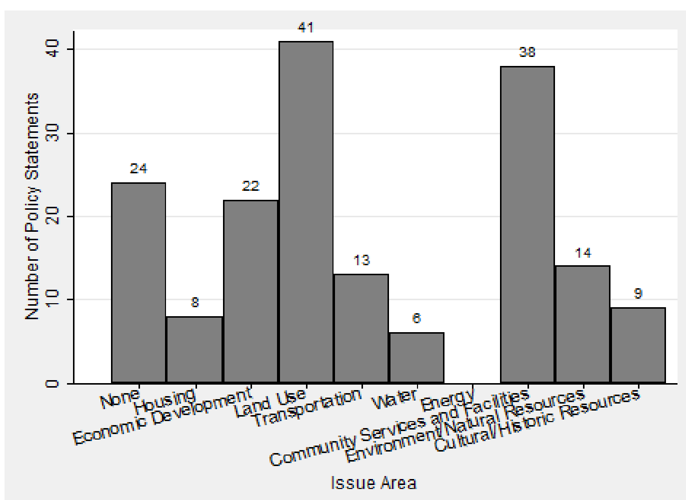

Figure 135: Distribution of Statements by Issue Area, Acworth

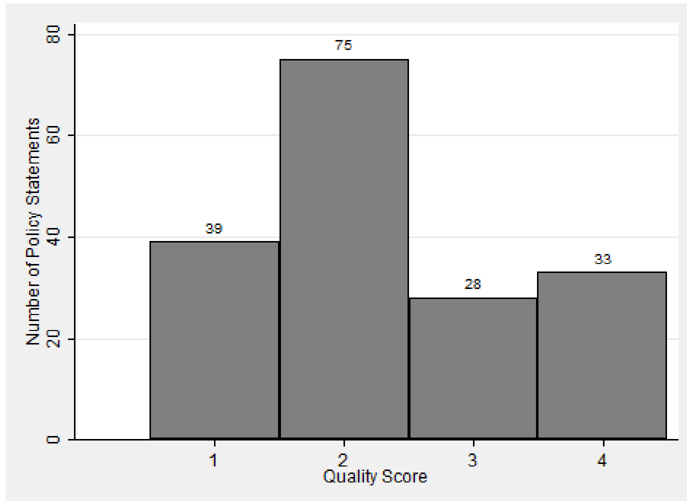

Figure 136: Distribution of Statements by Quality Score, Acworth

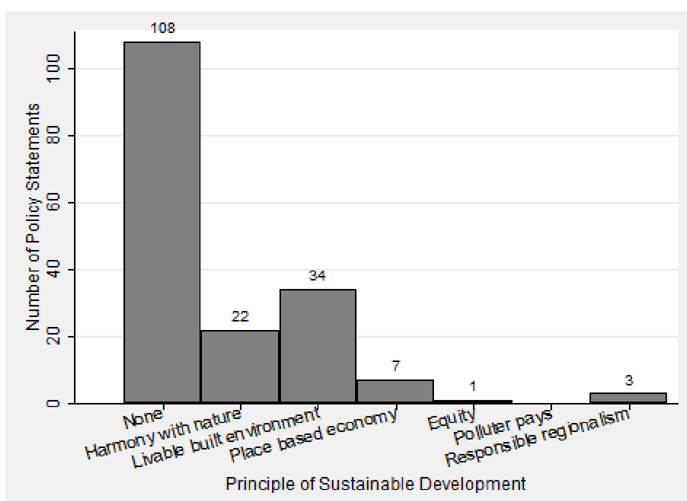

Figure 137: Distribution of Statements by Principle of Sustainable Development, Acworth

C.21 Plan details for Lovejoy

This section shows the distribution of statements for Lovejoy by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 138) show how the policy statements in the Lovejoy comprehensive plan are organized. Quality score distributions (Figure 139) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 140.

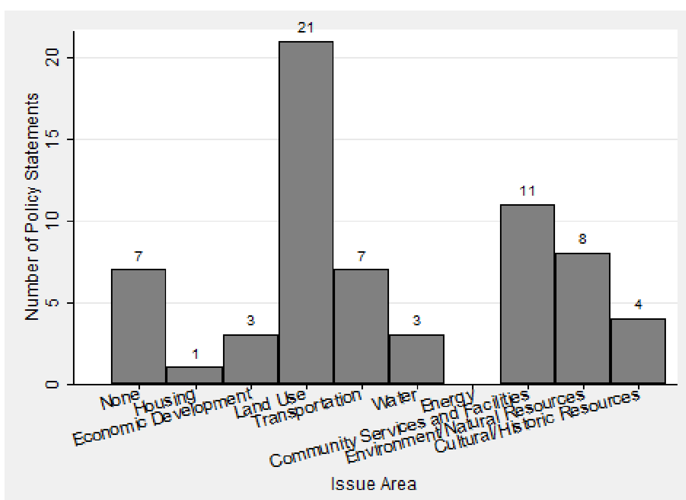

Figure 138: Distribution of Statements by Issue Area, Lovejoy

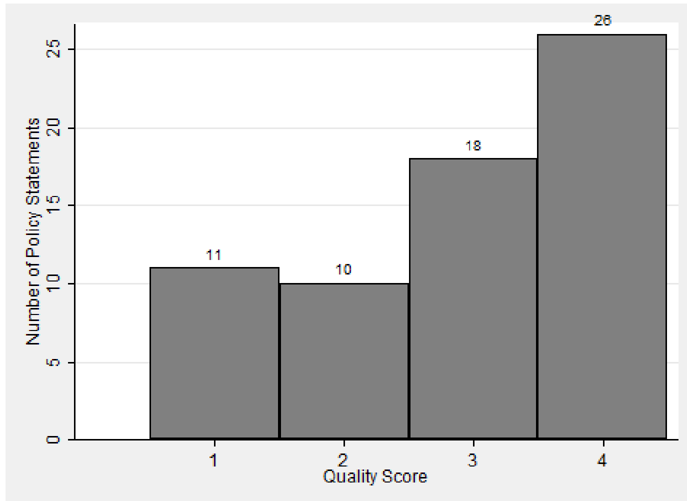

Figure 139: Distribution of Statements by Quality Score, Lovejoy

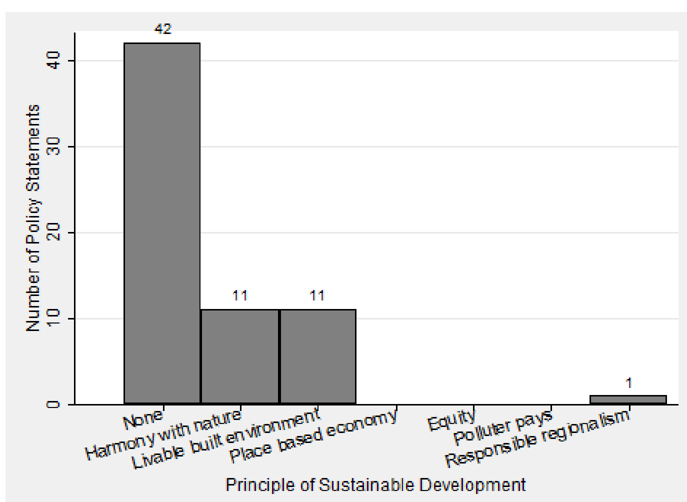

Figure 140: Distribution of Statements by Principle of Sustainable Development, Lovejoy

C.22 Plan details for Cobb County

This section shows the distribution of statements for Cobb County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 141) show how the policy statements in the Cobb County comprehensive plan are organized. Quality score distributions (Figure 142) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 143.

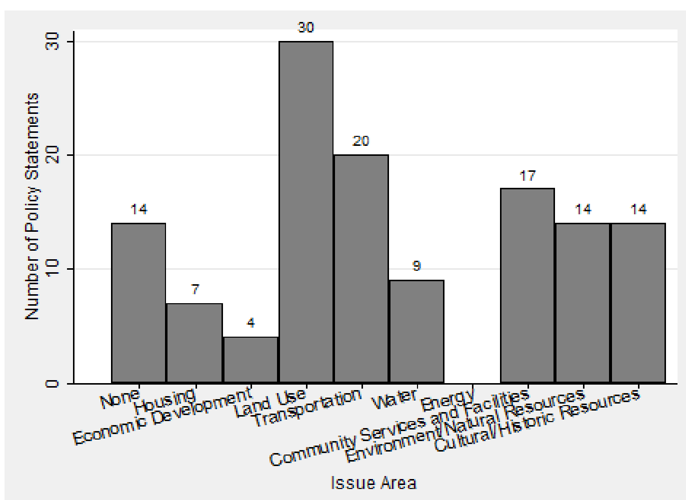

Figure 141: Distribution of Statements by Issue Area, Cobb County

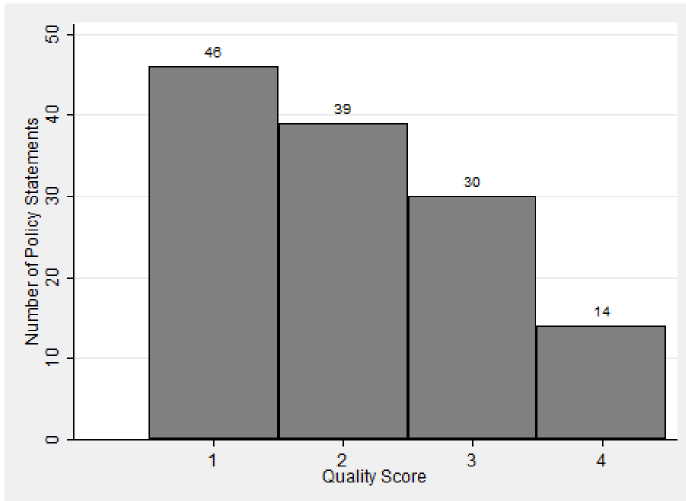

Figure 142: Distribution of Statements by Quality Score, Cobb County

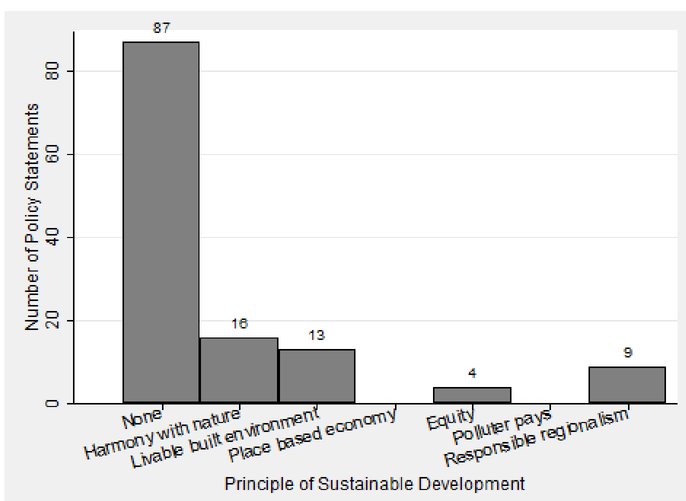

Figure 143: Distribution of Statements by Principle of Sustainable Development, Cobb County

C.23 Plan details for Coweta County

This section shows the distribution of statements for Coweta County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 144) show how the policy statements in the Coweta County comprehensive plan are organized. Quality score distributions (Figure 145) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 146.

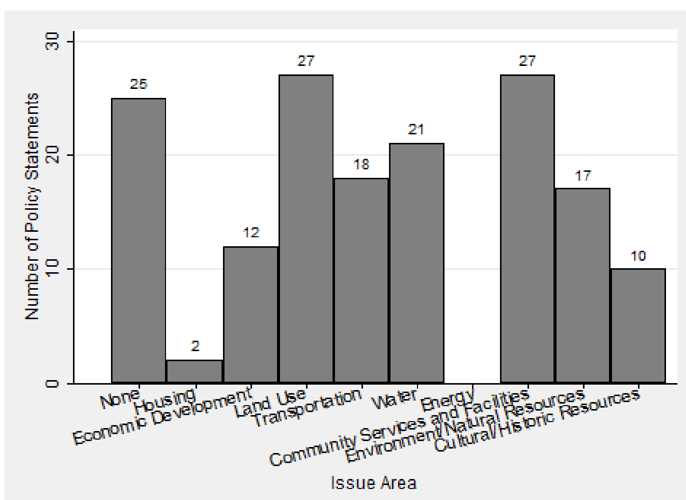

Figure 144: Distribution of Statements by Issue Area, Coweta County

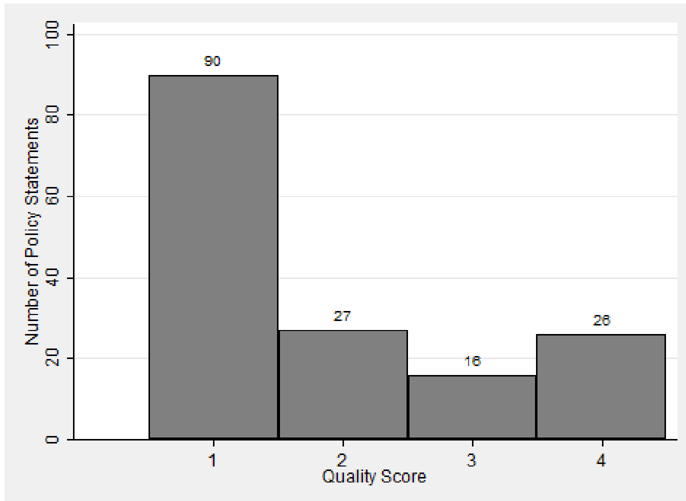

Figure 145: Distribution of Statements by Quality Score, Coweta County

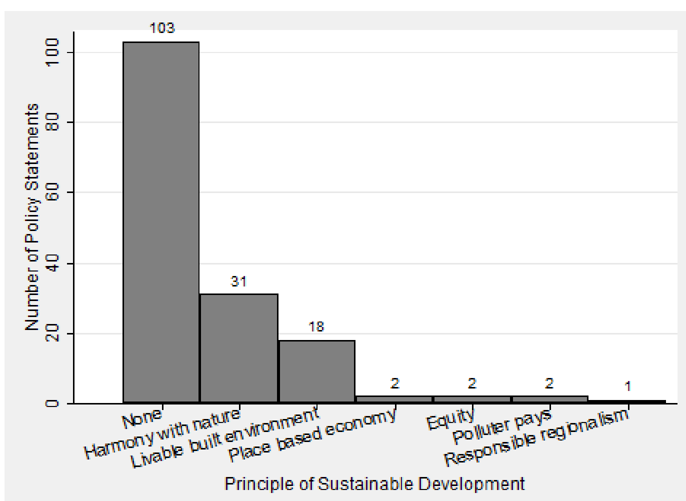

Figure 146: Distribution of Statements by Principle of Sustainable Development, Coweta County

C.24 Plan details for Smyrna

This section shows the distribution of statements for Smyrna by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 147) show how the policy statements in the Smyrna comprehensive plan are organized. Quality score distributions (Figure 148) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 149.

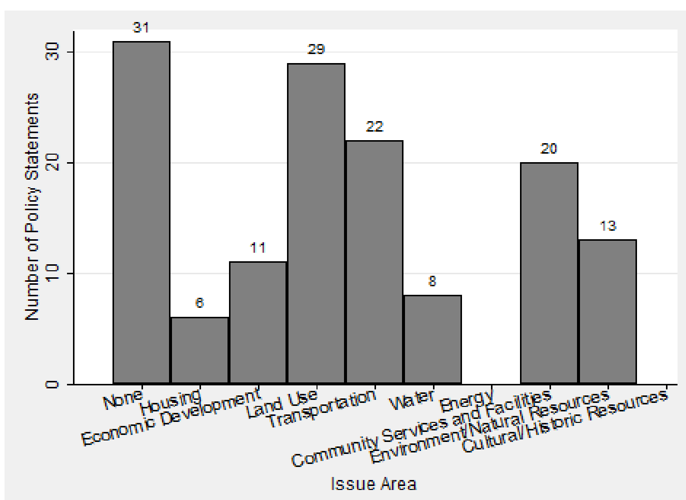

Figure 147: Distribution of Statements by Issue Area, Smyrna

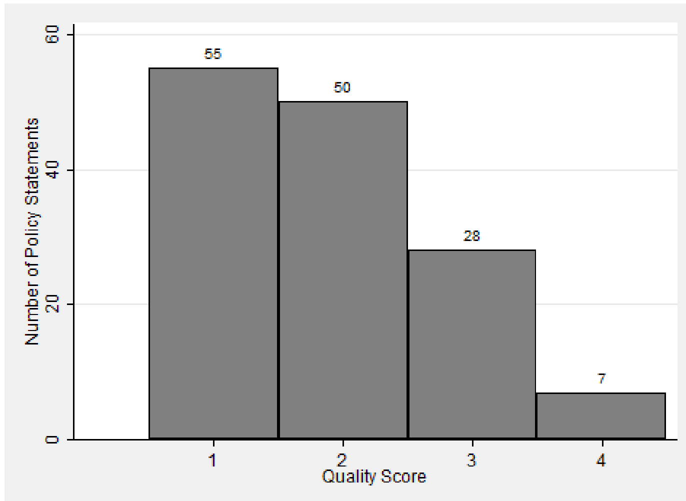

Figure 148: Distribution of Statements by Quality Score, Smyrna

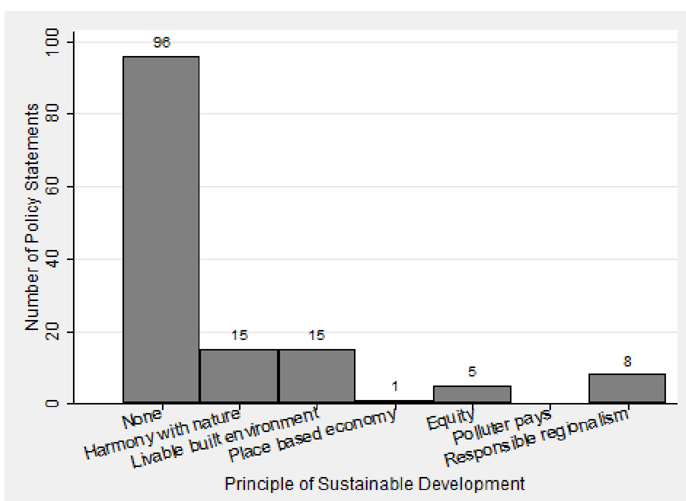

Figure 149: Distribution of Statements by Principle of Sustainable Development, Smyrna

C.25 Plan details for Walton

This section shows the distribution of statements for Walton by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 150) show how the policy statements in the Walton comprehensive plan are organized. Quality score distributions (Figure 151) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 152.

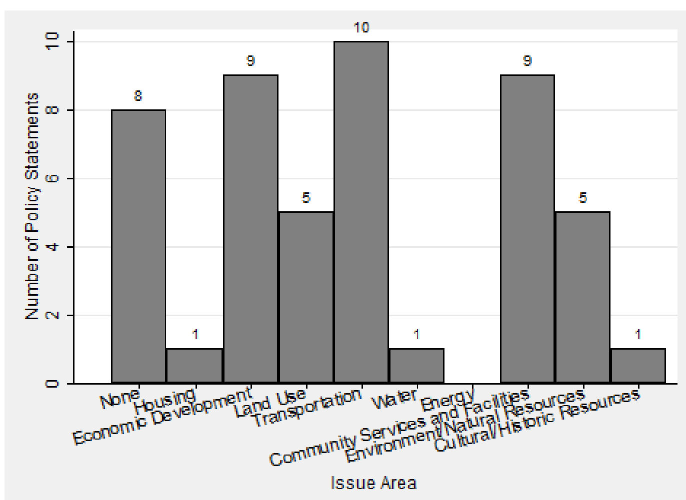

Figure 150: Distribution of Statements by Issue Area, Walton

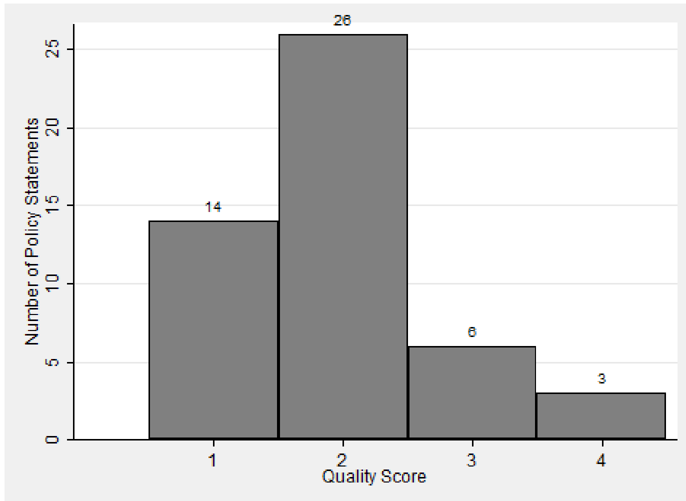

Figure 151: Distribution of Statements by Quality Score, Walton

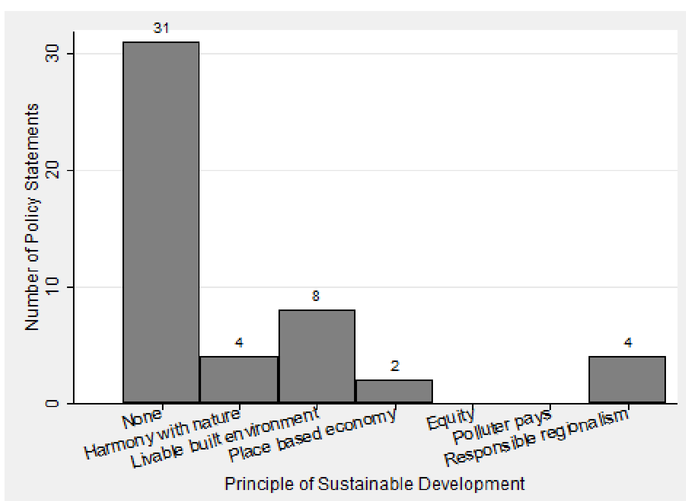

Figure 152: Distribution of Statements by Principle of Sustainable Development, Walton

C.26 Plan details for Cherokee County

This section shows the distribution of statements for Cherokee County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 153) show how the policy statements in the Cherokee County comprehensive plan are organized. Quality score distributions (Figure 154) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 155.

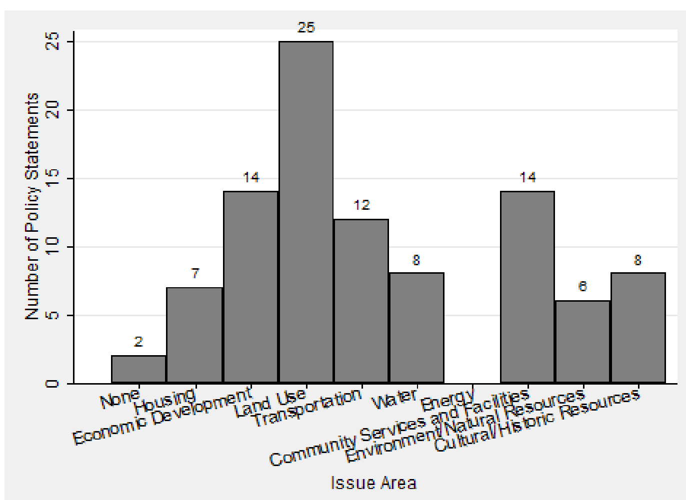

Figure 153: Distribution of Statements by Issue Area, Cherokee County

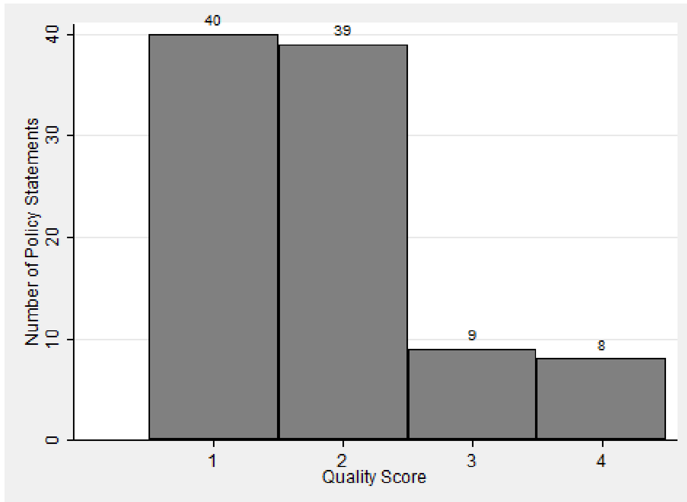

Figure 154: Distribution of Statements by Quality Score, Cherokee County

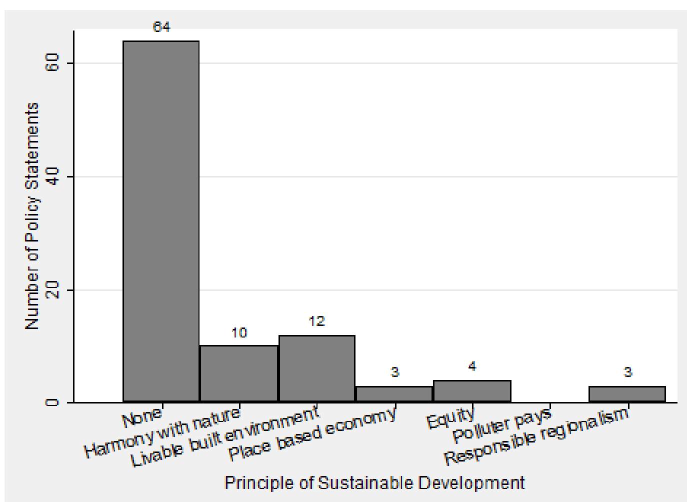

Figure 155: Distribution of Statements by Principle of Sustainable Development, Cherokee County

C.27 Plan details for Ball Ground

This section shows the distribution of statements for Ball Ground by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 156) show how the policy statements in the Ball Ground comprehensive plan are organized. Quality score distributions (Figure 157) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 158.

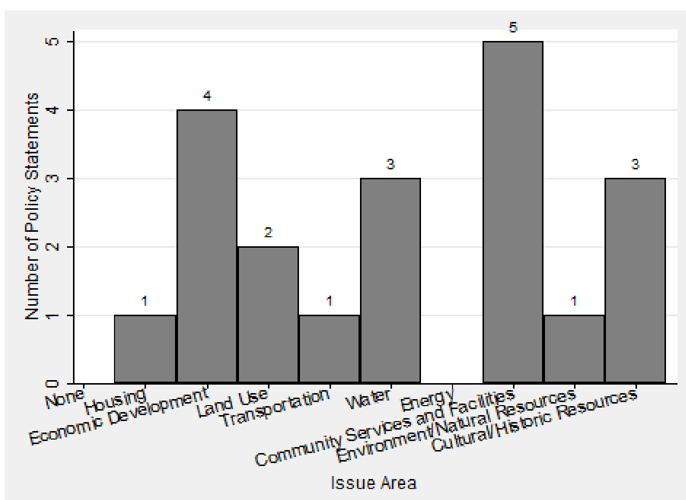

Figure 156: Distribution of Statements by Issue Area, Ball Ground

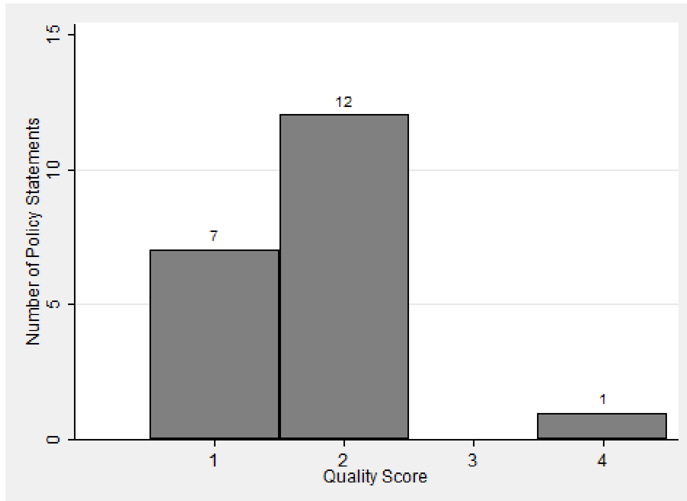

Figure 157: Distribution of Statements by Quality Score, Ball Ground

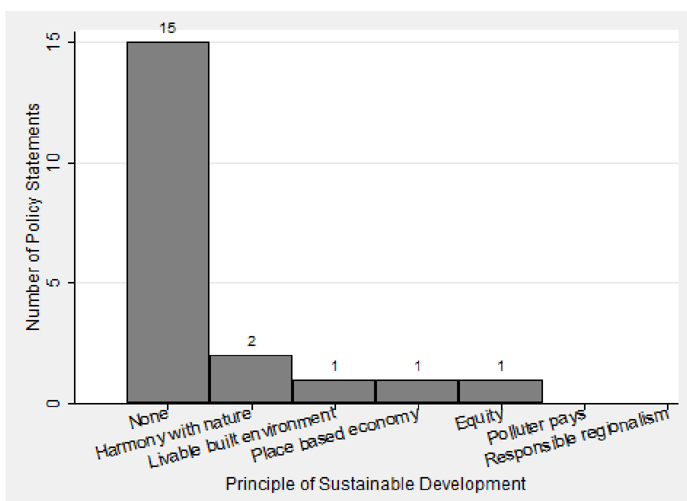

Figure 158: Distribution of Statements by Principle of Sustainable Development, Ball Ground

C.28 Plan details for Waleska

This section shows the distribution of statements for Waleska by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 159) show how the policy statements in the Waleska comprehensive plan are organized. Quality score distributions (Figure 160) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 161.

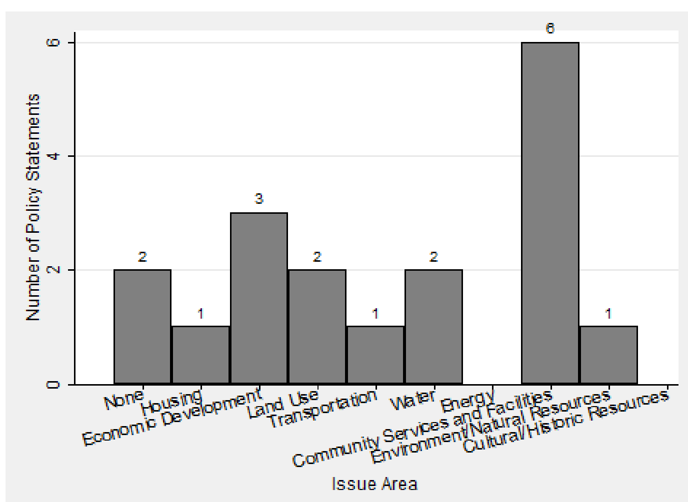

Figure 159: Distribution of Statements by Issue Area, Waleska

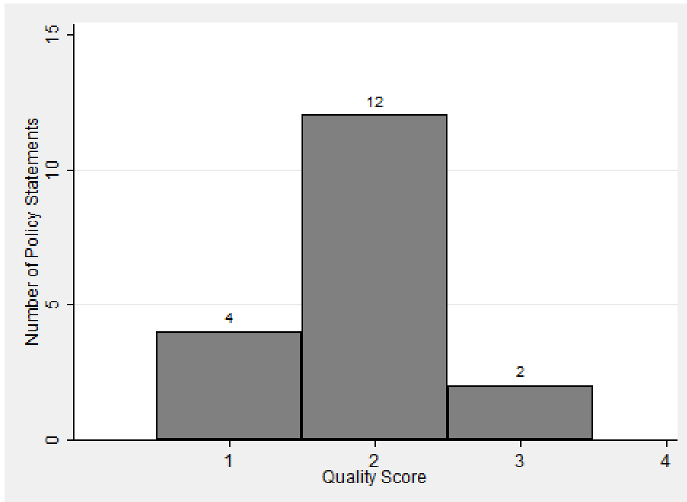

Figure 160: Distribution of Statements by Quality Score, Waleska

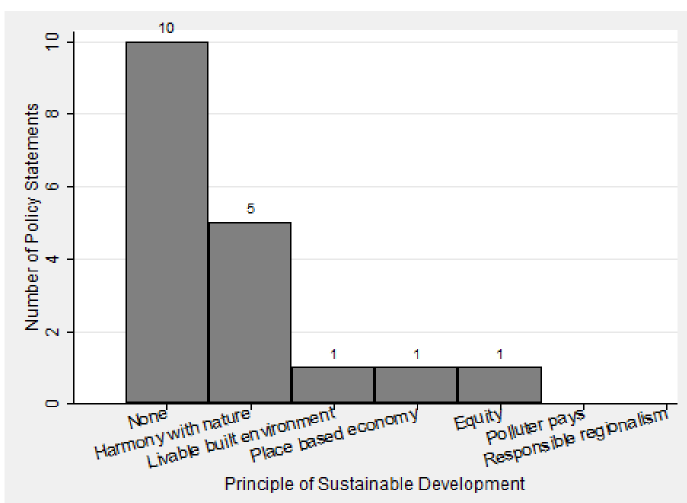

Figure 161: Distribution of Statements by Principle of Sustainable Development, Waleska

C.29 Plan details for Gwinnett County

This section shows the distribution of statements for Gwinnett County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 162) show how the policy statements in the Gwinnett County comprehensive plan are organized. Quality score distributions (Figure 163) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 164.

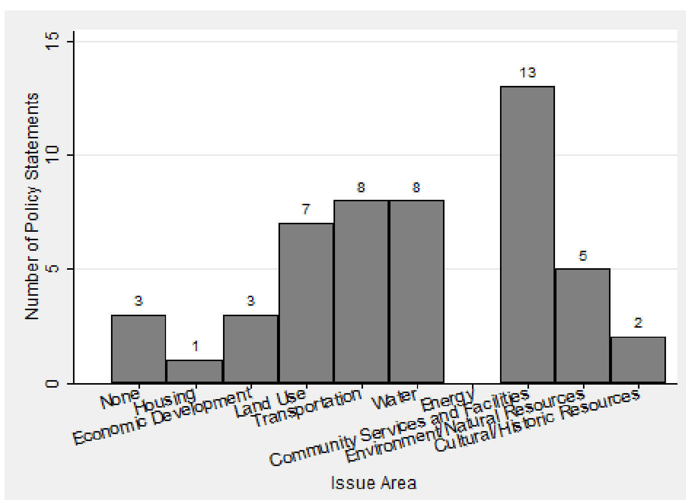

Figure 162: Distribution of Statements by Issue Area, Gwinnett County

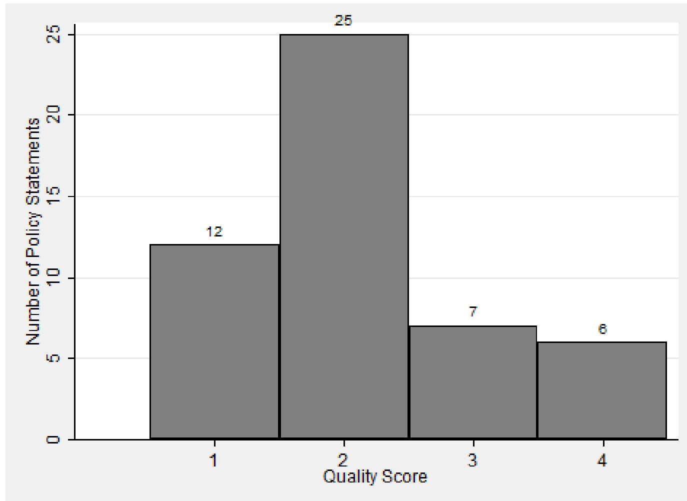

Figure 163: Distribution of Statements by Quality Score, Gwinnett County

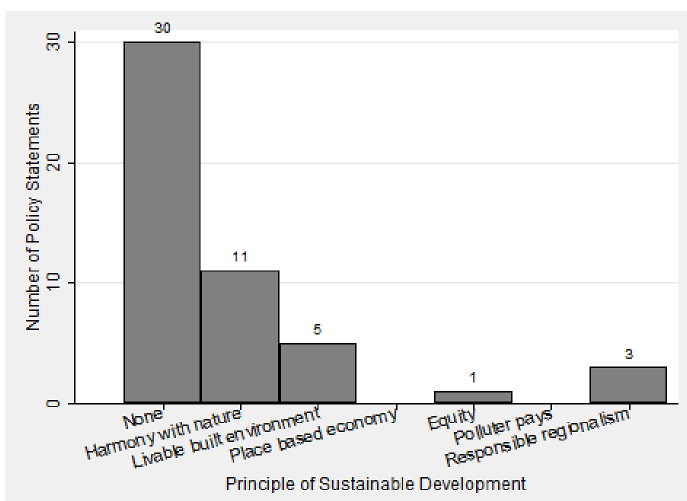

Figure 164: Distribution of Statements by Principle of Sustainable Development, Gwinnett County

C.30 Plan details for Dawson County

This section shows the distribution of statements for Dawson County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 165) show how the policy statements in the Dawson County comprehensive plan are organized. Quality score distributions (Figure 166) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 167.

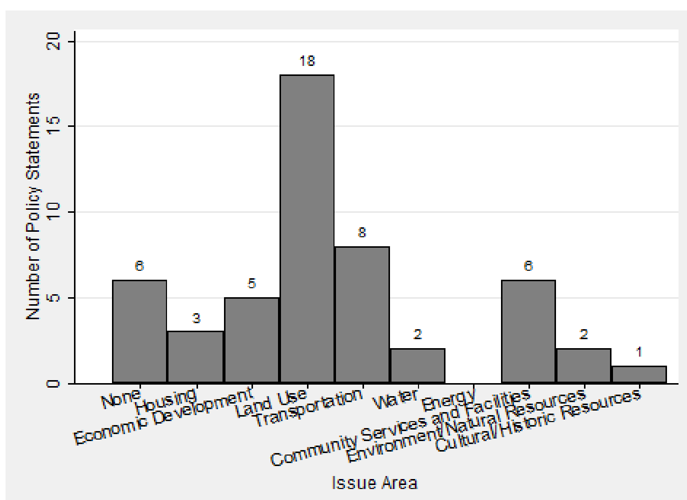

Figure 165: Distribution of Statements by Issue Area, Dawson County

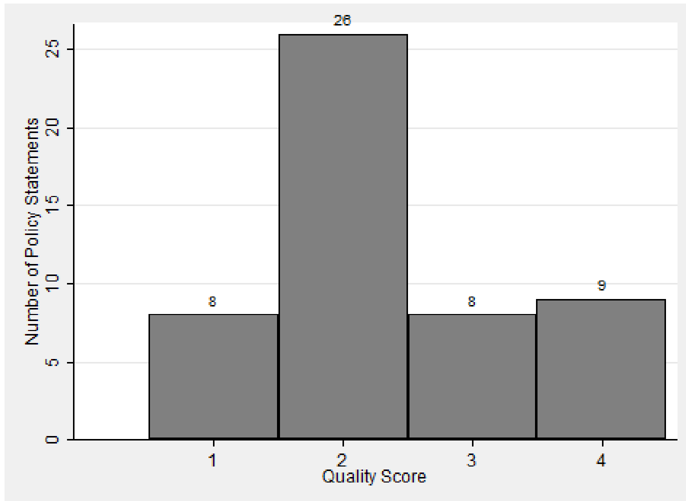

Figure 166: Distribution of Statements by Quality Score, Dawson County

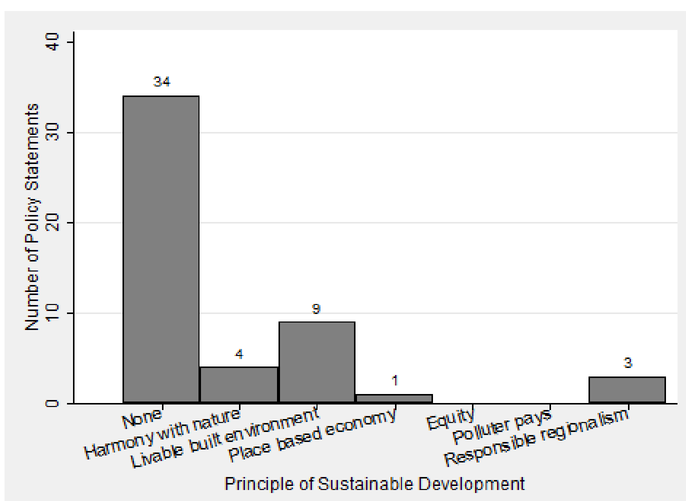

Figure 167: Distribution of Statements by Principle of Sustainable Development, Dawson County

C.31 Plan details for Butts County

This section shows the distribution of statements for Butts County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 168) show how the policy statements in the Butts County comprehensive plan are organized. Quality score distributions (Figure 169) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?

- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.

- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 170.

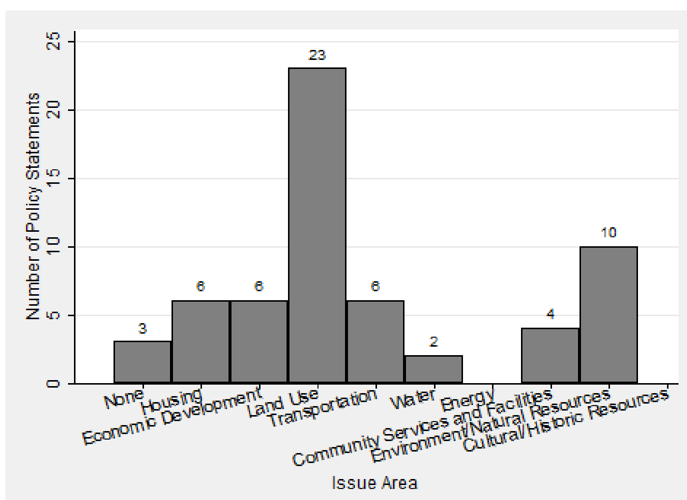

Figure 168: Distribution of Statements by Issue Area, Butts County

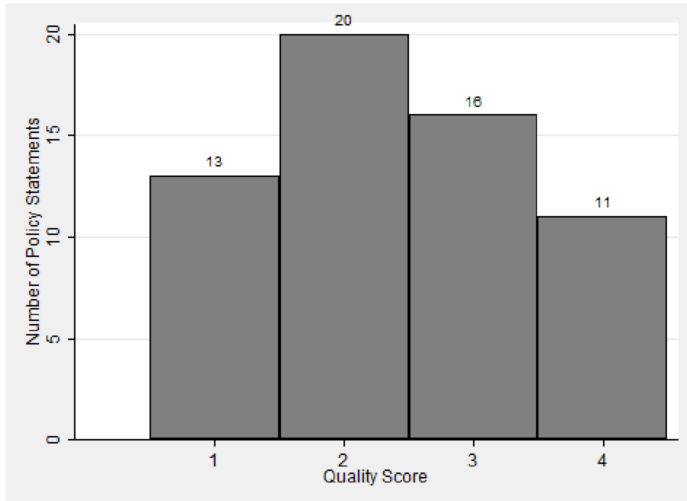

Figure 169: Distribution of Statements by Quality Score, Butts County

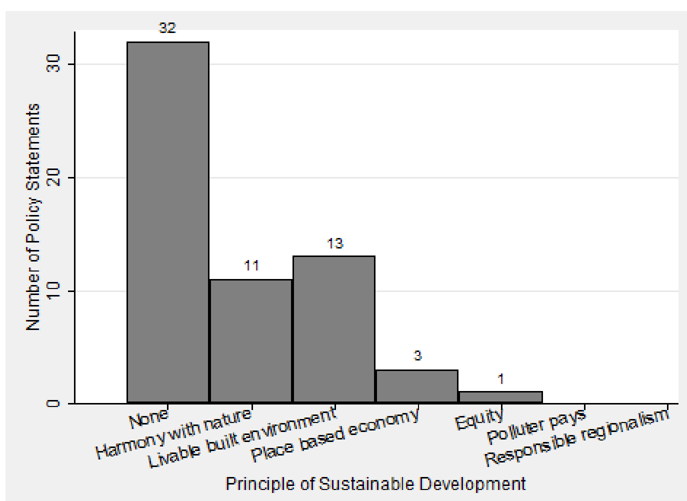

Figure 170: Distribution of Statements by Principle of Sustainable Development, Butts County

C.32 Plan details for Heard County

This section shows the distribution of statements for Heard County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 171) show how the policy statements in the Heard County comprehensive plan are organized. Quality score distributions (Figure 172) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 173.

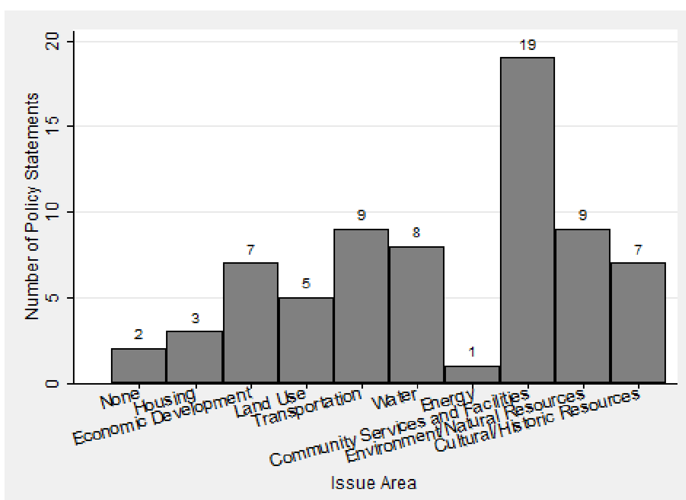

Figure 171: Distribution of Statements by Issue Area, Heard County

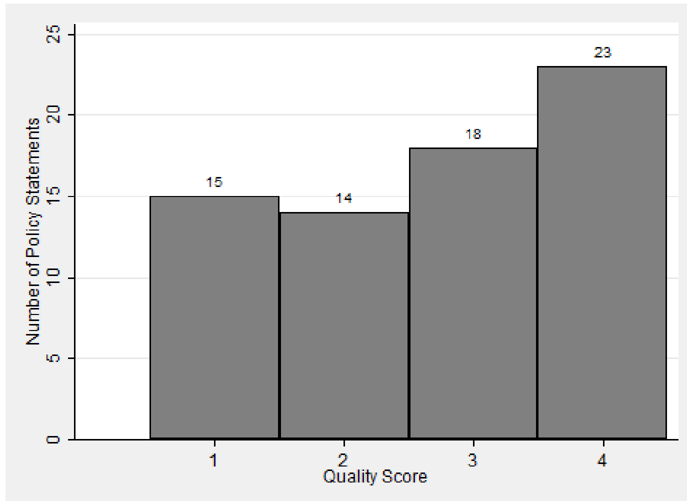

Figure 172: Distribution of Statements by Quality Score, Heard County

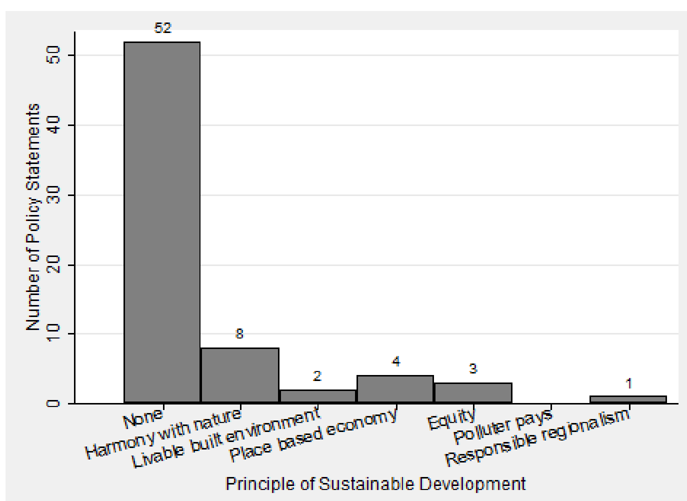

Figure 173: Distribution of Statements by Principle of Sustainable Development, Heard County

C.33 Plan details for Centralhatchee

This section shows the distribution of statements for Centralhatchee by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 174) show how the policy statements in the Centralhatchee comprehensive plan are organized. Quality score distributions (Figure 175) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 176.

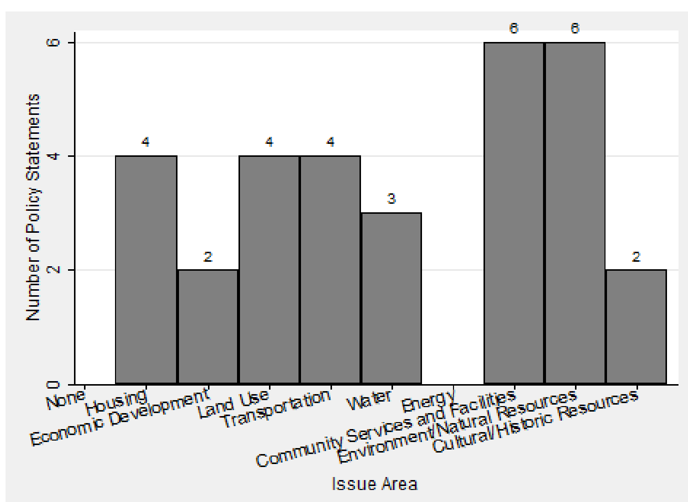

Figure 174: Distribution of Statements by Issue Area, Centralhatchee

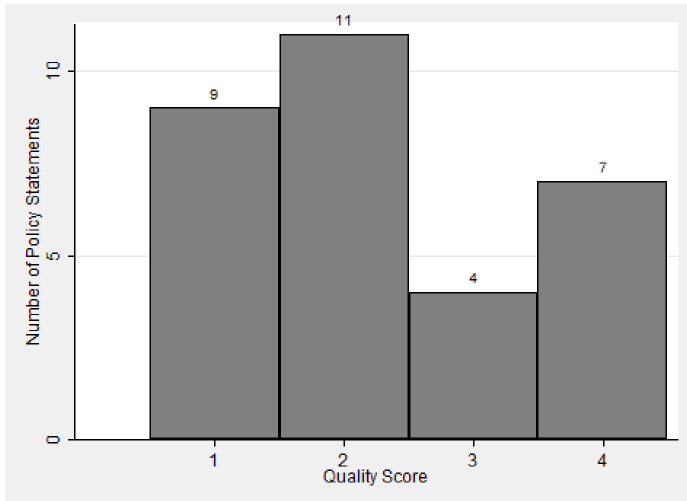

Figure 175: Distribution of Statements by Quality Score, Centralhatchee

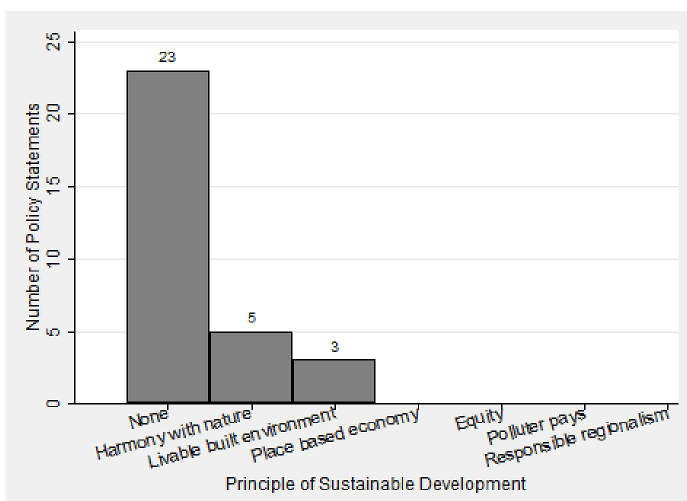

Figure 176: Distribution of Statements by Principle of Sustainable Development, Centralhatchee

C.34 Plan details for Ephesus

This section shows the distribution of statements for Ephesus by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 177) show how the policy statements in the Ephesus comprehensive plan are organized. Quality score distributions (Figure 178) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 179.

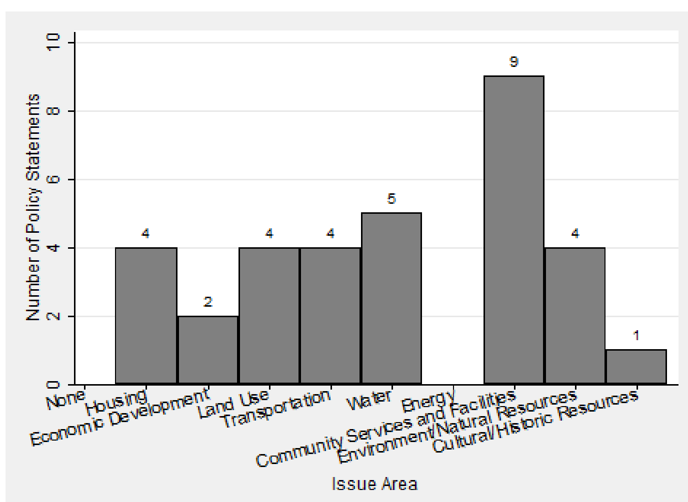

Figure 177: Distribution of Statements by Issue Area, Ephesus

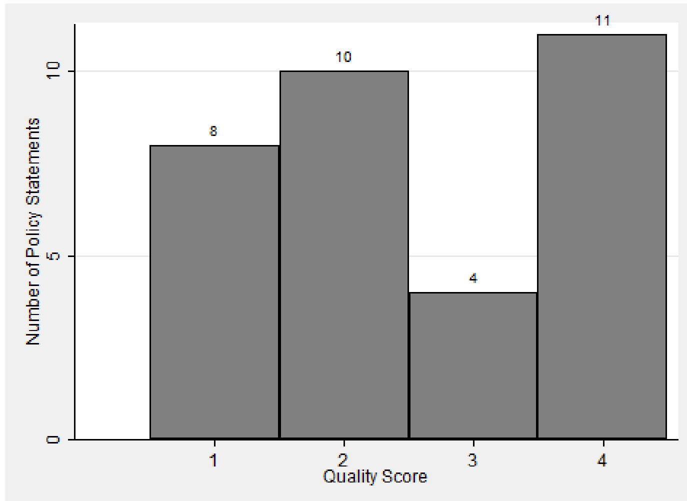

Figure 178: Distribution of Statements by Quality Score, Ephesus

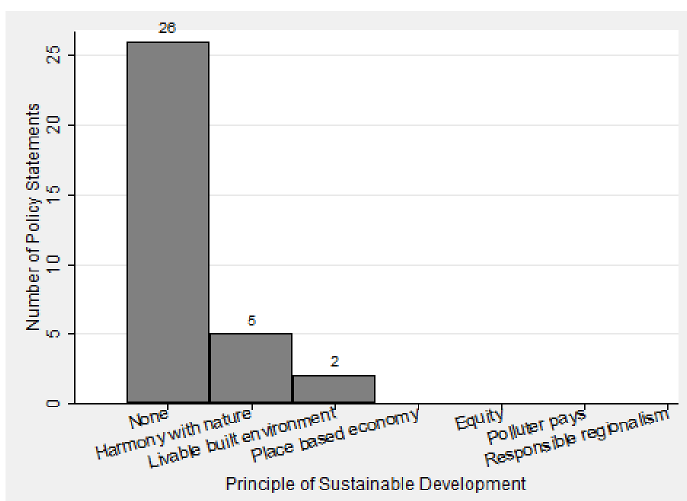

Figure 179: Distribution of Statements by Principle of Sustainable Development, Ephesus

C.35 Plan details for Franklin

This section shows the distribution of statements for Franklin by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 180) show how the policy statements in the Franklin comprehensive plan are organized. Quality score distributions (Figure 181) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 182.

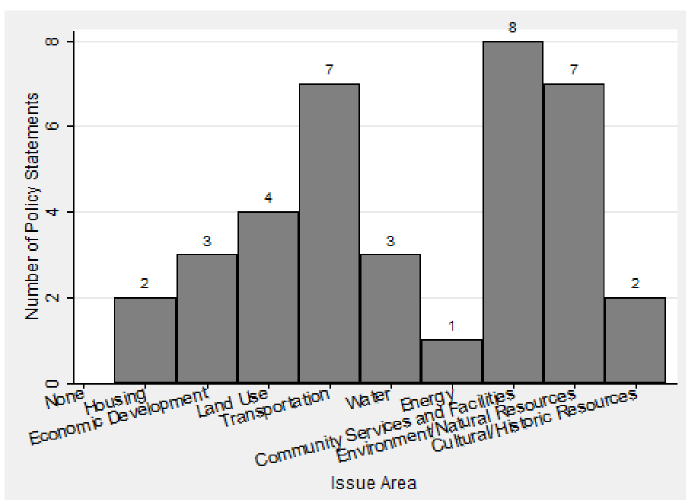

Figure 180: Distribution of Statements by Issue Area, Franklin

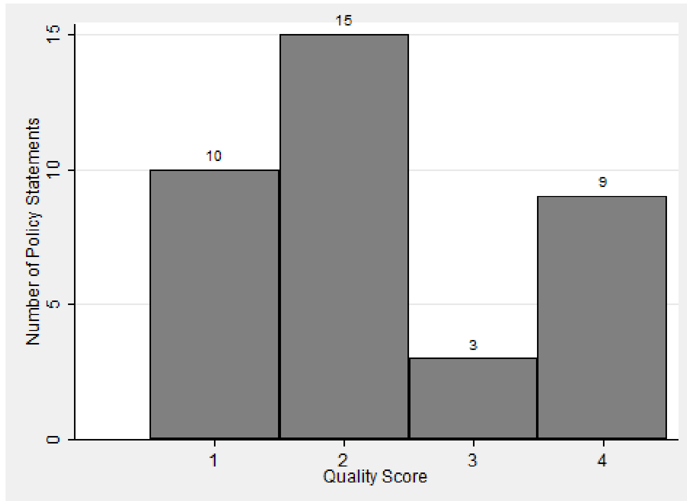

Figure 181: Distribution of Statements by Quality Score, Franklin

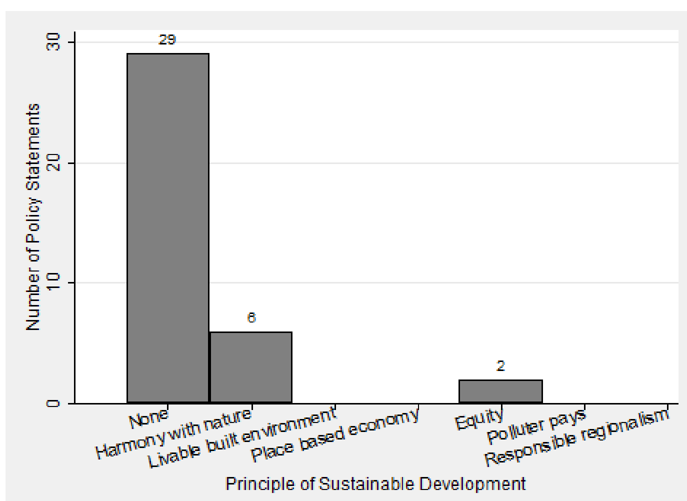

Figure 182: Distribution of Statements by Principle of Sustainable Development, Franklin

C.36 Plan details for Pickens County

This section shows the distribution of statements for Pickens County by issue area, quality score, and commitment to sustainable development. Distribution by issue area (Figure 183) show how the policy statements in the Pickens County comprehensive plan are organized. Quality score distributions (Figure 184) indicate how statements scored on the 1-4 scale; recall that each statement receives a 1 for inclusion and 1 point each for the following:

- Is the policy statement worded in strong (such as: adopt or build) as opposed to weak language (such as: encourage or try)?
- Is the policy statement clear and specific? A clear statement would include how to go forward with the policy.
- Is there a measurable policy action? Could we look back later and check to see if the policy statement had indeed been accomplished.

Distributions by commitment to sustainable development show how many statements relate to the six principles of sustainable development measured in this analysis; see Figure 185.

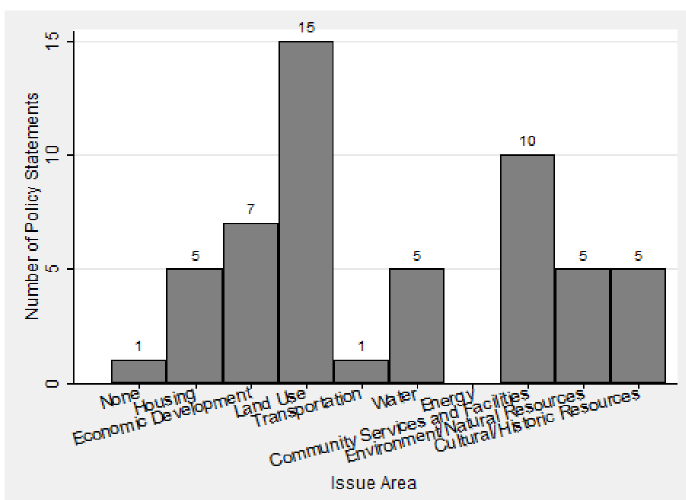

Figure 183: Distribution of Statements by Issue Area, Pickens County

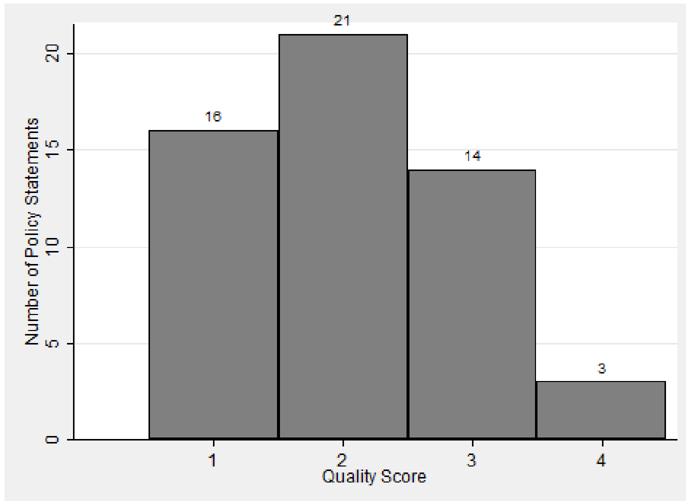

Figure 184: Distribution of Statements by Quality Score, Pickens County

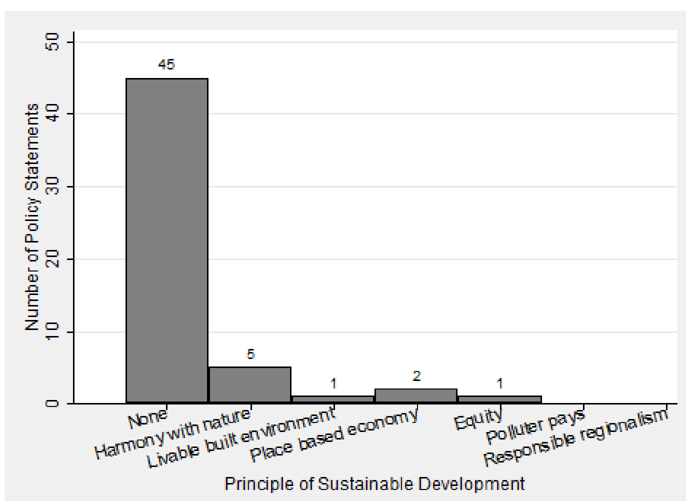

Figure 185: Distribution of Statements by Principle of Sustainable Development, Pickens County

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